

**LIFENET HEALTH  
REGISTRATION NO. 61491  
COMPLIANCE TEST REPORT  
DETERMINATION  
OF  
ETHYLENE OXIDE REMOVAL EFFICIENCY**

**FEBRUARY 06, 2019**

**Prepared for**

**LIFENET HEALTH  
1864 CONCERT DRIVE  
VIRGINIA BEACH, VIRGINIA 23453**

**Prepared by**

**AIR MONITORING SPECIALISTS, INC.  
22 RODMAN ROAD  
RICHMOND, VIRGINIA 23224**

**Project**

**3M MODEL AE ABATORS AB-A, AB-B AND AB-C**

**Reviewed by**

**Initials: JNH**

**Date: 3/12/19**

## REPORT CERTIFICATION

The sampling and analysis performed for this report were carried out under my direction and supervision, and I hereby certify that, to the best of my knowledge, the test report is authentic and accurate.

Signature:

Date: FEBRUARY 28, 2019

Bruce A. Gerber

President

Air Monitoring Specialists, Inc.

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## EXECUTIVE SUMMARY

Air Monitoring Specialists, Inc. (AMS) was retained by LifeNet Health (Registration NO. 61491), to determine the ethylene oxide removal efficiency for three catalytic abators (AB-A, AB-B and AB-C). The removal efficiency tests were performed in a series of three one-hour tests. The tests were conducted on February 06, 2019 at the facility located at 1864 Concert Drive in Virginia Beach, Virginia. The results of the removal efficiency tests are summarized in the following tables:

**TABLE I-1**

**SUMMARY OF ABATOR AB-A ETHYLENE OXIDE REMOVAL EFFICIENCY**

| <b>TEST #</b>                     | <b>ETHYLENE OXIDE / PPM</b> | <b>REMOVAL EFFICIENCY / %</b> |
|-----------------------------------|-----------------------------|-------------------------------|
| <b>1 - INLET</b>                  | <b>632</b>                  |                               |
| <b>OUTLET</b>                     | <b>0.612</b>                | <b>99.9</b>                   |
| <b>2 - INLET</b>                  | <b>1,199</b>                |                               |
| <b>OUTLET</b>                     | <b>0.598</b>                | <b>99.9</b>                   |
| <b>3 - INLET</b>                  | <b>820</b>                  |                               |
| <b>OUTLET</b>                     | <b>0.602</b>                | <b>99.9</b>                   |
| <b>AVERAGE INLET</b>              | <b>883.7</b>                |                               |
| <b>AVERAGE OUTLET</b>             | <b>0.604</b>                |                               |
| <b>AVERAGE REMOVAL EFFICIENCY</b> |                             | <b>99.9</b>                   |

**TABLE I-2**  
**SUMMARY OF ABATOR AB-B ETHYLENE OXIDE REMOVAL EFFICIENCY**

| <b>TEST #</b>                     | <b>ETHYLENE OXIDE / PPM</b> | <b>REMOVAL EFFICIENCY / %</b> |
|-----------------------------------|-----------------------------|-------------------------------|
| <b>1 - INLET</b>                  | <b>474</b>                  |                               |
| OUTLET                            | 2.22                        | <b>99.5</b>                   |
| <b>2 - INLET</b>                  | <b>901</b>                  |                               |
| OUTLET                            | 13.8                        | <b>98.5</b>                   |
| <b>3 - INLET</b>                  | <b>658</b>                  |                               |
| OUTLET                            | 0.602                       | <b>99.9</b>                   |
| <br><b>AVERAGE INLET</b>          | <b>677.7</b>                |                               |
| <b>AVERAGE OUTLET</b>             | <b>5.54</b>                 |                               |
| <b>AVERAGE REMOVAL EFFICIENCY</b> |                             | <b>99.3</b>                   |

**TABLE I-3**  
**SUMMARY OF ABATOR AB-C ETHYLENE OXIDE REMOVAL EFFICIENCY**

| <b>TEST #</b>                     | <b>ETHYLENE OXIDE / PPM</b> | <b>REMOVAL EFFICIENCY / %</b> |
|-----------------------------------|-----------------------------|-------------------------------|
| <b>1 - INLET</b>                  | <b>514</b>                  |                               |
| OUTLET                            | 5.59                        | <b>98.9</b>                   |
| <b>2 - INLET</b>                  | <b>965</b>                  |                               |
| OUTLET                            | 7.46                        | <b>99.2</b>                   |
| <b>3 - INLET</b>                  | <b>877</b>                  |                               |
| OUTLET                            | 12.0                        | <b>98.6</b>                   |
| <br><b>AVERAGE INLET</b>          | <b>785.3</b>                |                               |
| <b>AVERAGE OUTLET</b>             | <b>8.35</b>                 |                               |
| <b>AVERAGE REMOVAL EFFICIENCY</b> |                             | <b>98.9</b>                   |

## **1.0 INTRODUCTION**

Removal efficiency testing was conducted at LifeNet Health in Virginia Beach, Virginia on February 06, 2019, to determine the ethylene oxide removal efficiency for three catalytic abators (AB-A, AB-B and AB-C).

### **1.1 TEST PARTICIPANTS**

Table 1-1 lists the personnel involved in the test program.

**TABLE 1-1**  
**TEST PARTICIPANTS**

|                                  |                                             |
|----------------------------------|---------------------------------------------|
| LifeNet Health                   | Jeremy Hirschbeck – Senior Process Engineer |
| Air Monitoring Specialists, Inc. | Phillip Gerber                              |

### **1.2 OUTLINE OF TEST PROGRAM**

Table 1-2 is a test log that presents the sampling locations, primary test methods used, test dates, run numbers and run times for the test program.

**TABLE 1-2**  
**TEST LOG**

| Sampling Location  | Test Run Methods | Test Run Date     | Test Run Numbers and Times |
|--------------------|------------------|-------------------|----------------------------|
| Abator AB-A Inlet  | EPA Method 18    | February 06, 2019 | 1 08:48 – 09:48            |
|                    | EPA Method 18    | February 06, 2019 | 2 11:34 – 12:34            |
|                    | EPA Method 18    | February 06, 2019 | 3 14:21 – 15:21            |
| Abator AB-A Outlet | EPA Method 18    | February 06, 2019 | 1 08:48 – 09:48            |
|                    | EPA Method 18    | February 06, 2019 | 2 11:34 – 12:34            |
|                    | EPA Method 18    | February 06, 2019 | 3 14:21 – 15:21            |

**TABLE 1-2 (CONT.)****TEST LOG**

| <b>Sampling Location</b> | <b>Test Run Methods</b> | <b>Test Run Date</b> | <b>Test Run Numbers and Times</b> |
|--------------------------|-------------------------|----------------------|-----------------------------------|
| Abator AB-B Inlet        | EPA Method 18           | February 06, 2019    | 1 08:55 – 09:55                   |
|                          | EPA Method 18           | February 06, 2019    | 2 11:31 – 12:31                   |
|                          | EPA Method 18           | February 06, 2019    | 3 14:12 – 15:12                   |
| Abator AB-B Outlet       | EPA Method 18           | February 06, 2019    | 1 08:55 – 09:55                   |
|                          | EPA Method 18           | February 06, 2019    | 2 11:31 – 12:31                   |
|                          | EPA Method 18           | February 06, 2019    | 3 14:12 – 15:12                   |
| Abator AB-C Inlet        | EPA Method 18           | February 06, 2019    | 1 09:03 – 10:03                   |
|                          | EPA Method 18           | February 06, 2019    | 2 11:42 – 12:42                   |
|                          | EPA Method 18           | February 06, 2019    | 3 14:40 – 15:40                   |
| Abator AB-C Outlet       | EPA Method 18           | February 06, 2019    | 1 09:03 – 10:03                   |
|                          | EPA Method 18           | February 06, 2019    | 2 11:42 – 12:42                   |
|                          | EPA Method 18           | February 06, 2019    | 3 14:40 – 15:40                   |

**2.0 PROCESS DESCRIPTION AND OPERATION**

3M 8XL Steri-Vac EO sterilizers #2 (S/N 350605), #4 (S/N 350607), and #6 (S/N 350634) and Abators A (S/N 170110), B (S/N 170109), C (S/N 170115) were used during this efficiency testing. EO sterilizer #2 is connected to Abator A, EO sterilizer #4 is connected to Abator B, and EO sterilizer #6 is connected to Abator C. The sterilizers were preset to allow only one sterilizer to exhaust at a time. Three cycles were run and one 170 gram EO cartridge was used for each cycle. During the testing, it was verified that the Abator Ready “Green” light was ON before the start of each cycle.

The following cycle operating parameters were used:

- Cycle Description: Custom stored in program 2
- Preheat: 0 minutes
- Vacuum: 160 mBar
- Relative Humidity 60%
- Exposure 3 minutes
- Aeration 0 minutes, no locked aeration

Sampling was started after completion of the Gas Expose Phase. Gas removal to the Abator was indicated on the sterilizer front panel by a drop in chamber pressure. When

this occurred, the LNH engineer communicated to the sampler to start collecting the sample from the Abator.

### **3.0 SAMPLING AND ANALYTICAL PROCEDURES**

#### **3.1 SAMPLING POINTS**

Quarter inch tube fittings are located on the catalytic abators inlet and outlet piping.

#### **3.2 ETHYLENE OXIDE**

Ethylene oxide concentrations were determined using U.S. EPA Reference Method 18, "Measurement of Gaseous Organic Compound Emissions by Gas Chromatography." Three one-hour test runs for ethylene oxide removal efficiency were conducted on the inlet and outlet ducts of the three abators utilizing EPA Method 18.

Sample Collection. Samples were withdrawn from the sources at a constant rate using an EPA Method 18 sampling train. The sampling rate was approximately 0.12 liters per minute. The sampling train consists of a Teflon probe line, rotameter, an air tight container containing a ten-liter Tedlar bag, sample/purge valve, rotameter and a metering console with pump and vacuum gauge.

Sample Recovery. The Tedlar bag was removed from the air tight container. The bag was examined for condensation in the bag. No condensation was observed in the sample bags. The bag was then labeled and the information recorded on the chain of custody form, the bag was then stored in an opaque container until delivery to the laboratory.

Sample Analysis. Enthalpy Analytical, Inc. performed the EPA Method 18 analytical procedures. All sample bags were received by the lab in good condition, no condensation observed in the sample bags. Analysis could not be performed if condensation was observed in the sample bags.

### **4.0 QUALITY ASSURANCE/QUALITY CONTROL**

#### **4.1 GENERAL**

Air Monitoring Specialists, Inc. (AMS) is committed to the continued implementation of a Quality Assurance Program to assure the quality of sampling and analytical procedures of environmental measurement data. The Quality Assurance measures taken during this test project equal or exceed the minimum QA/QC recommendations as set forth by the U.S. Environmental Protection Agency (EPA) for a particular method. The following sections outline the QA program implemented by AMS to justify the validity of test

procedures. As applicable, the QA system for the various test programs addresses the following areas:

- Preventive Maintenance
- Internal/External System Checks
- Data Reduction & validation
- QA/QC Summary

#### **4.2 PREVENTIVE MAINTENANCE**

An effective preventive maintenance program decreases downtime and thus increases data completeness and quality. Pretest and posttest equipment calibrations are conducted in a manner and at a frequency, which meets or exceeds U.S. EPA specifications. Each item transported to the field is inspected to detect equipment problems that originate during periods of storage. All equipment returning from the field is cleaned, repaired, reconditioned, and recalibrated as necessary. Routine maintenance on equipment (sampling probes, heated sample lines, flow meters, and valves) is carried out periodically for leaks, corrosion, dents, or any other damage.

#### **4.3 INTERNAL/EXTERNAL SYSTEM AUDIT CHECKS**

System and performance audits are routine elements of all AMS QA/QC programs.

Internal Systems Audit: The following sampling equipment checks were conducted prior to sample collection. All sampling equipment was thoroughly checked to ensure clean and operable components.

- All sampling equipment was thoroughly checked to ensure clean and operable components.
- Equipment was inspected for possible damage from shipment.

External Systems Audits: AMS is subject to a system audit each time a test is conducted for any Air Pollution Control agency. This procedure entails an observer on-site to do qualitative evaluation of performance to demonstrate compliance with the applicable regulations.

#### **4.4 DATA REDUCTION AND VALIDATION**

The test team leader is responsible for reviewing and validating data as they are acquired. Each team leader has extensive knowledge of sampling methodology and the characteristics of the process being measured and is capable of evaluating the accuracy, representativeness, and completeness of raw data on-site. Action to replace inadequate data can be taken immediately.

Data obtained during calibrations and test runs are recorded on standardized forms that are checked twice for completeness and accuracy by the QA Director or his designated representative. Data reduction and consistency are achieved by using the standardized forms and using AMS's in-house computer facilities.

#### **4.5 QA/QC SUMMARY**

EPA Method 18: A recovery study was performed on a bag sample from each test location; the percent recovery met the requirements of section 8.4.2. The results can be found in the laboratory report in Appendix B.

## ***Appendix A***

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### ***Field Data***

## ***Appendix B***

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### ***CD With Laboratory Report***

## *Appendix C*

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### *Process Data*

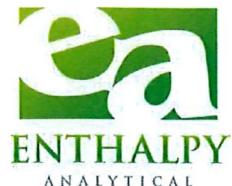
# Air Monitoring Specialists, Inc.

22 Rodman Rd.  
Richmond, VA 23224

Lifenet Health  
Concert Drive

Analytical Report  
(0219-044)

*EPA Method 18 (Bags)*  
Ethylene oxide



**Enthalpy Analytical, LLC**

Phone: (919) 850 - 4392 / Fax: (919) 850 - 9012 / [www.enthalpy.com](http://www.enthalpy.com)  
800-1 Capitola Drive Durham, NC 27713-4385

I certify that to the best of my knowledge all analytical data presented in this report:

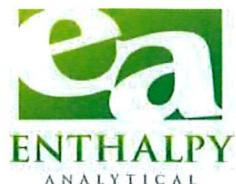
- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 280 pages.

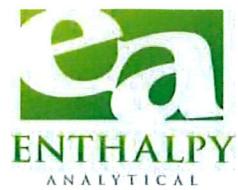


QA Review Performed by – Quentisha L. Forrester

Report Issued: 02/21/2019



# Summary of Results



## **Enthalpy Analytical**

Company: Air Monitoring Specialists, Inc.

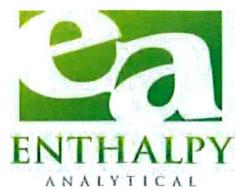
Job No.: 0219-044 - EPA Method 18 (Bags)

Client No.: Lifenet Health - Concert Drive

### **Summary - Ethylene oxide**

| Sample Train Name | Adj. Sample Conc. (ppm) |    |
|-------------------|-------------------------|----|
| #1-1              | 632                     |    |
| #1-2              | 0.612                   | ND |
| #2-1              | 474                     |    |
| #2-2              | 2.22                    | J  |
| #3-1              | 514                     |    |
| #3-2              | 5.59                    | J  |
| #1-3              | 1,199                   |    |
| #1-4              | 0.598                   | ND |
| #2-3              | 901                     |    |
| #2-4              | 13.8                    |    |
| #3-3              | 965                     |    |
| #3-4              | 7.46                    |    |
| #1-5              | 820                     |    |
| #1-6              | 0.602                   | ND |
| #2-5              | 658                     |    |
| #2-6              | 0.602                   | ND |
| #3-5              | 877                     |    |
| #3-6              | 12.0                    |    |

# Results



## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
 Job No.: 0219-044 - EPA Method 18 (Bags)  
 Client No.: Lifenet Health - Concert Drive

Sample Analysis Method Used:

A = BETTYP957\_EO.M

D = BETTYP1038\_EO\_COMBINED.M

B = BETTYP1042\_EO\_AVG\_1038.M

C = BETTYP1038\_EO.M

## Ethylene oxide

| Client's Sample Name | Filename #1 | Filename #2 | Filename #3 | Analysis Method | MDL   | Curve Min | Curve Max | Ret Time (min) | Ret Time (min) | %dif RT | Conc #1 (ppm) | Conc #2 (ppm) | Conc #3 (ppm) | %dif conc | DF    | Avg Conc (ppm) | Spike Recovery | Adj. Conc (ppm) | Flag |   |
|----------------------|-------------|-------------|-------------|-----------------|-------|-----------|-----------|----------------|----------------|---------|---------------|---------------|---------------|-----------|-------|----------------|----------------|-----------------|------|---|
| #1-1                 | 021B1402.D  | 021B1403.D  | A           | 0.485           | 4.85  | 243       | 2.74      | 2.74           | 2.74           | 0.0     | 18.0          | 17.9          | 18.0          | 0.4       | 31    | 557            | 88.1%          | 632             |      |   |
| #1-2                 | 019B2001.D  | 019B2002.D  | A           | 0.485           | 4.85  | 243       | NA        | NA             | NA             | 0.485   | 0.485         | 0.485         | 0.0           | 1         | 0.485 | 79.2%          | 0.612          | ND              |      |   |
| #2-1                 | 028B1501.D  | 028B1502.D  | 028B1503.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 13.5          | 13.5          | 13.4      | 0.4   | 31             | 418            | 88.1%           | 474  |   |
| #2-2                 | 029B2101.D  | 029B2102.D  | 029B2103.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 1.77          | 1.84          | 1.66      | 5.5   | 1              | 1.75           | 78.2%           | 2.22 | J |
| #3-1                 | 027B0701.D  | 027B0702.D  | 027B0703.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 21.6          | 21.6          | 21.6      | 0.2   | 21             | 453            | 88.1%           | 514  |   |
| #3-2                 | 028B2201.D  | 028B2202.D  | 028B2203.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 4.43          | 4.38          | 4.48      | 1.2   | 1              | 4.43           | 79.2%           | 5.59 | J |
| #4-3                 | 019B0902.D  | 019B0903.D  | A           | 0.485           | 4.85  | 243       | 2.73      | 2.74           | 2.74           | 0.0     | 63.8          | 63.9          | 63.9          | 0.2       | 21    | 1,341          | 112%           | 1,199           |      |   |
| #4-4                 | 019B1301.D  | 019B1401.D  | 019B1402.D  | A               | 0.485 | 4.85      | 243       | NA             | NA             | NA      | 0.485         | 0.485         | 0.485         | 0.0       | 1     | 0.485          | 81.1%          | 0.538           | ND   |   |
| #2-3                 | 023B1201.D  | 023B1202.D  | 023B1203.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 47.9          | 48.0          | 48.0      | 0.1   | 21             | 1,007          | 112%            | 901  |   |
| #2-4                 | 019B0701.D  | 019B0702.D  | 019B0703.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 11.2          | 11.2          | 11.3      | 0.2   | 1              | 11.2           | 81.1%           | 13.8 |   |
| #3-3                 | 029B0801.D  | 029B0802.D  | 029B0803.D  | A               | 0.485 | 4.85      | 243       | 2.73           | 2.74           | 2.74    | 0.0           | 51.4          | 51.5          | 51.3      | 0.2   | 21             | 1,079          | 112%            | 965  |   |
| #3-4                 | 030B1001.D  | 030B1002.D  | 030B1003.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 6.02          | 6.04          | 6.10      | 0.8   | 1              | 6.05           | 81.1%           | 7.46 |   |
| #4-5                 | 026B0101.D  | 026B0201.D  | 026B0202.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.73    | 0.1           | 30.8          | 31.1          | 31.1      | 0.6   | 31             | 960            | 117%            | 820  |   |
| #4-6                 | 020B1001.D  | 020B1002.D  | 020B1003.D  | A               | 0.485 | 4.85      | 243       | NA             | NA             | NA      | 0.485         | 0.485         | 0.485         | 0.0       | 1     | 0.485          | 80.6%          | 0.602           | ND   |   |
| #2-5                 | 030B1302.D  | 030B1303.D  | A           | 0.485           | 4.85  | 243       | 2.74      | 2.74           | 2.74           | 0.0     | 36.8          | 36.6          | 36.8          | 0.4       | 21    | 771            | 117%           | 658             |      |   |
| #2-6                 | 023B0901.D  | 023B0902.D  | 023B0903.D  | A               | 0.485 | 4.85      | 243       | NA             | NA             | NA      | 0.485         | 0.485         | 0.485         | 0.0       | 1     | 0.485          | 80.6%          | 0.602           | ND   |   |
| #3-5                 | 026B0601.D  | 026B0602.D  | 026B0603.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 49.7          | 47.5          | 49.6      | 2.9   | 21             | 1,027          | 117%            | 877  |   |
| #3-6                 | 020B0801.D  | 020B0802.D  | 020B0803.D  | A               | 0.485 | 4.85      | 243       | 2.74           | 2.74           | 2.74    | 0.0           | 9.60          | 9.64          | 9.68      | 0.4   | 1              | 9.64           | 80.6%           | 12.0 |   |

**Enthalpy Analytical**

Company: Air Monitoring Specialists, Inc.  
 Job No.: 0219-044 - EPA Method 18 (Bags)  
 Client No.: Lifenet Health - Concert Drive

Sample Analysis Method Used:

A = BETTYP957\_EO.M

D = BETTYP1038\_EO\_COMBINED.M

B = BETTYP1042\_EO\_AVG\_1038.M

C = BETTYP1038\_EO.M

**Ethylene oxide**

| Client's Sample Name | Filename #1 | Filename #2 | Filename #3 | Analysis Method | MDL   | Curve Min | Curve Max | Ret Time (min) | Ret Time (min) | %dif RT | Conc #1 (ppm) | Conc #2 (ppm) | Conc #3 (ppm) | %dif conc | DF | Avg Conc (ppm) | Spike Recovery | Adj. Conc (ppm) | Flag |
|----------------------|-------------|-------------|-------------|-----------------|-------|-----------|-----------|----------------|----------------|---------|---------------|---------------|---------------|-----------|----|----------------|----------------|-----------------|------|
| #2-2 SPK             | 019B1402.D  | 019B1403.D  | 019B1404.D  | B               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 16.0          | 16.2          | 16.1          | 0.8       | 1  | 16.1           |                |                 |      |
| #3-1 BL              | 019B0201.D  | 019B0202.D  | 019B0203.D  | D               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 20.6          | 20.7          | 20.8          | 0.6       | 21 | 435            |                |                 |      |
| #3-1 BL SPK          | 020B1401.D  | 020B1402.D  | 020B1403.D  | B               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 27.4          | 29.3          | 28.9          | 4.1       | 21 | 599            |                |                 |      |
| #1-4 SPK             | 019B0901.D  | 019B0902.D  | 019B0903.D  | B               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 15.2          | 15.4          | 15.3          | 0.8       | 1  | 15.3           |                |                 |      |
| #3-3 BL              | 019B0401.D  | 019B0402.D  | 019B0403.D  | D               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 45.0          | 45.9          | 45.5          | 1.1       | 21 | 955            |                |                 |      |
| #3-3 BL SPK          | 019B1501.D  | 019B1502.D  | 019B1503.D  | B               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 60.8          | 61.5          | 60.6          | 0.8       | 21 | 1,280          |                |                 |      |
| #1-6 D               | 019B0101.D  | 019B0102.D  | 019B0103.D  | D               | 0.485 | 5.12      | 256       | NA             | NA             | NA      | 0.485         | 0.485         | 0.485         | 0.0       | 1  | 0.485          |                |                 |      |
| #1-6 D SPK           | 019B0602.D  | 019B0603.D  | 019B0604.D  | C               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 15.6          | 15.8          | 15.8          | 0.9       | 1  | 15.7           |                |                 |      |
| #3-5 D               | 019B0801.D  | 019B0802.D  | 019B0803.D  | D               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 54.1          | 53.5          | 53.6          | 0.7       | 21 | 1,129          |                |                 |      |
| #3-5 D SPK           | 019B0401.D  | 019B0402.D  | 019B0403.D  | B               | 0.485 | 5.12      | 256       | 2.73           | 2.73           | 0.0     | 69.9          | 73.0          | 73.5          | 3.1       | 21 | 1,515          |                |                 |      |

## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

## Spike Hold Times

| Spiked Bag   | Time Spiked      | Spike Analyzed   | Hold Time (Hours) | Related Bag | Related Bag Sampled Date | Bag Analyzed     | Hold Time (Hours) |
|--------------|------------------|------------------|-------------------|-------------|--------------------------|------------------|-------------------|
| 3-1 BL SPK   | 02-11-2019 12:32 | 02-13-2019 06:22 | 41.8              | In 1-1      | 02-06-2019 08:48         | 02-07-2019 19:07 | 34.3              |
|              |                  |                  |                   | In 2-1      | 02-06-2019 08:55         | 02-07-2019 19:30 | 34.6              |
|              |                  |                  |                   | In 3-1      | 02-06-2019 09:03         | 02-07-2019 16:27 | 31.4              |
| 3-3 BL SPK   | 02-11-2019 13:35 | 02-13-2019 06:52 | 41.3              | In 1-3      | 02-06-2019 11:34         | 02-07-2019 17:13 | 29.7              |
|              |                  |                  |                   | In 2-3      | 02-06-2019 11:31         | 02-07-2019 18:22 | 30.9              |
|              |                  |                  |                   | In 3-3      | 02-06-2019 11:42         | 02-07-2019 16:50 | 29.1              |
| 3-5 D BL SPK | 02-11-2019 15:08 | 02-13-2019 09:53 | 42.8              | In 1-5      | 02-06-2019 14:40         | 02-08-2019 08:46 | 42.1              |
|              |                  |                  |                   | In 2-5      | 02-06-2019 14:12         | 02-07-2019 18:45 | 28.6              |
|              |                  |                  |                   | In 3-5      | 02-06-2019 14:21         | 02-07-2019 16:05 | 25.7              |
| 1-4 SPK      | 02-11-2019 10:52 | 02-13-2019 12:48 | 49.9              | Out 1-4     | 02-06-2019 11:34         | 02-08-2019 12:36 | 49.0              |
|              |                  |                  |                   | Out 2-4     | 02-06-2019 11:31         | 02-07-2019 10:42 | 23.2              |
|              |                  |                  |                   | Out 3-4     | 02-06-2019 11:42         | 02-07-2019 11:51 | 24.2              |
| 1-6 D SPK    | 02-11-2019 11:34 | 02-12-2019 16:47 | 29.2              | Out 1-6     | 02-06-2019 14:40         | 02-07-2019 17:36 | 26.9              |
|              |                  |                  |                   | Out 2-6     | 02-06-2019 14:12         | 02-07-2019 11:28 | 21.3              |
|              |                  |                  |                   | Out 3-6     | 02-06-2019 14:21         | 02-07-2019 11:05 | 20.7              |
| 2-2 SPK      | 02-11-2019 10:36 | 02-13-2019 16:57 | 54.4              | Out 1-2     | 02-06-2019 08:48         | 02-08-2019 13:47 | 53.0              |
|              |                  |                  |                   | Out 2-2     | 02-06-2019 08:55         | 02-08-2019 14:10 | 53.3              |
|              |                  |                  |                   | Out 3-2     | 02-06-2019 09:03         | 02-08-2019 14:33 | 53.5              |

## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

### Spiked Bag

| #3-1 BL SPK    |                          | Ethylene oxide |
|----------------|--------------------------|----------------|
| Before Spiking | Inj1 (ppmv)              | 433            |
|                | Inj2 (ppmv)              | 434            |
|                | Inj3 (ppmv)              | 437            |
|                | Avg ppmv                 | 435            |
|                | Bag vol L NTP            | 1.93           |
| Gas Spike      | Cylinder                 | MKBF0692       |
|                | Expires                  | 6/5/19         |
|                | Press/Temp               | 759.7 / 67.0   |
|                | Vol (mL)                 | 200            |
|                | Cyl Dil Factor           | 401            |
|                | Cyl Conc (ppmv)          | 995,000        |
|                | Vol (mL NTP)             | 0.497          |
| Totals         | Sp Bag Vol L NTP         | 2.13           |
|                | Corrected Initial (ppmv) | 394            |
|                | Spike Amount (mL NTP)    | 0.497          |
|                | Spike Amount (ppmv)      | 233            |
|                | Expected (ppmv)          | 627            |
| Result         | Inj1 (ppmv)              | 575            |
|                | Inj2 (ppmv)              | 616            |
|                | Inj3 (ppmv)              | 607            |
|                | Avg (ppmv)               | 599            |
|                | <b>Recovery</b>          | <b>88.1%</b>   |

## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

### Spiked Bag

| #3-3 BL SPK    |                          | Ethylene oxide |
|----------------|--------------------------|----------------|
| Before Spiking | Inj1 (ppmv)              | 945            |
|                | Inj2 (ppmv)              | 965            |
|                | Inj3 (ppmv)              | 956            |
|                | Avg ppmv                 | 955            |
|                | Bag vol L NTP            | 2.30           |
| Gas Spike      | Cylinder                 | MKBF0692       |
|                | Expires                  | 6/5/19         |
|                | Press/Temp               | 759.0 / 67.0   |
|                | Vol (mL)                 | 500            |
|                | Cyl Dil Factor           | 401            |
|                | Cyl Conc (ppmv)          | 995,000        |
|                | Vol (mL NTP)             | 500            |
| Totals         | Sp Bag Vol L NTP         | 2.80           |
|                | Corrected Initial (ppmv) | 785            |
|                | Spike Amount (mL NTP)    | 1.24           |
|                | Spike Amount (ppmv)      | 443            |
|                | Expected (ppmv)          | 1,228          |
| Result         | Inj1 (ppmv)              | 1,278          |
|                | Inj2 (ppmv)              | 1,291          |
|                | Inj3 (ppmv)              | 1,272          |
|                | Avg (ppmv)               | 1,280          |
|                | <b>Recovery</b>          | <b>112%</b>    |

## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

### Spiked Bag

| #3-5 D         |                          | Ethylene oxide |
|----------------|--------------------------|----------------|
| Before Spiking | Inj1 (ppmv)              | 1,136          |
|                | Inj2 (ppmv)              | 1,124          |
|                | Inj3 (ppmv)              | 1,125          |
|                | Avg ppmv                 | 1,129          |
|                | Bag vol L NTP            | 2.52           |
| Gas Spike      | Cylinder                 | MKBF0692       |
|                | Expires                  | 6/5/19         |
|                | Press/Temp               | 759.0 / 67.5   |
|                | Vol (mL)                 | 700            |
|                | Cyl Dil Factor           | 401            |
|                | Cyl Conc (ppmv)          | 995,000        |
|                | Vol (mL NTP)             | 700            |
| Totals         | Sp Bag Vol L NTP         | 3.22           |
|                | Corrected Initial (ppmv) | 883            |
|                | Spike Amount (mL NTP)    | 1.74           |
|                | Spike Amount (ppmv)      | 539            |
|                | Expected (ppmv)          | 1,423          |
| Result         | Inj1 (ppmv)              | 1,469          |
|                | Inj2 (ppmv)              | 1,533          |
|                | Inj3 (ppmv)              | 1,544          |
|                | Avg (ppmv)               | 1,515          |
|                | Recovery                 | 117%           |

## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

### Spiked Bag

| #1-4 SPK       |                          | Ethylene oxide |
|----------------|--------------------------|----------------|
| Before Spiking | Inj1 (ppmv)              | 0.00           |
|                | Inj2 (ppmv)              | 0.00           |
|                | Inj3 (ppmv)              | 0.00           |
|                | Avg ppmv                 | 0.00           |
|                | Bag vol L NTP            | 1.43           |
| Gas Spike      | Cylinder                 | CC122424       |
|                | Expires                  | 3/9/19         |
|                | Press/Temp               | 760.2 / 67.0   |
|                | Vol (mL)                 | 120            |
|                | Cyl Dil Factor           | 1              |
|                | Cyl Conc (ppmv)          | 243            |
|                | Vol (mL NTP)             | 120            |
| Totals         | Sp Bag Vol L NTP         | 1.55           |
|                | Corrected Initial (ppmv) | 0.00           |
|                | Spike Amount (mL NTP)    | 0.0292         |
|                | Spike Amount (ppmv)      | 18.9           |
|                | Expected (ppmv)          | 18.9           |
| Result         | Inj1 (ppmv)              | 15.2           |
|                | Inj2 (ppmv)              | 15.4           |
|                | Inj3 (ppmv)              | 15.3           |
|                | Avg (ppmv)               | 15.3           |
|                | Recovery                 | 81.1%          |

## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

### Spiked Bag

| #1-6 D SPK     |                          | Ethylene oxide |
|----------------|--------------------------|----------------|
| Before Spiking | Inj1 (ppmv)              | 0.00           |
|                | Inj2 (ppmv)              | 0.00           |
|                | Inj3 (ppmv)              | 0.00           |
|                | Avg ppmv                 | 0.00           |
|                | Bag vol L NTP            | 2.18           |
| Gas Spike      | Cylinder                 | CC122424       |
|                | Expires                  | 3/9/19         |
|                | Press/Temp               | 759.7 / 67.0   |
|                | Vol (mL)                 | 190            |
|                | Cyl Dil Factor           | 1              |
|                | Cyl Conc (ppmv)          | 243            |
|                | Vol (mL NTP)             | 190            |
|                |                          | 0.0462         |
| Totals         | Sp Bag Vol L NTP         | 2.37           |
|                | Corrected Initial (ppmv) | 0.00           |
|                | Spike Amount (mL NTP)    | 0.0462         |
|                | Spike Amount (ppmv)      | 19.5           |
|                | Expected (ppmv)          | 19.5           |
| Result         | Inj1 (ppmv)              | 15.6           |
|                | Inj2 (ppmv)              | 15.8           |
|                | Inj3 (ppmv)              | 15.8           |
|                | Avg (ppmv)               | 15.7           |
|                | <b>Recovery</b>          | <b>80.6%</b>   |

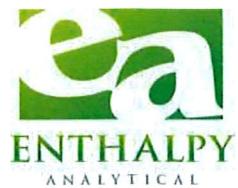
## Enthalpy Analytical

Company: Air Monitoring Specialists, Inc.  
Job No.: 0219-044 - EPA Method 18 (Bags)  
Client No.: Lifenet Health - Concert Drive

### Spiked Bag

| #2-2 SPK        |                          | Ethylene oxide |
|-----------------|--------------------------|----------------|
| Before Spiking  | Inj1 (ppmv)              | 1.77           |
|                 | Inj2 (ppmv)              | 1.84           |
|                 | Inj3 (ppmv)              | 1.66           |
|                 | Avg ppmv                 | 1.75           |
|                 | Bag vol L NTP            | 2.46           |
| Gas Spike       | Cylinder                 | CC122424       |
|                 | Expires                  | 3/9/19         |
|                 | Press/Temp               | 759.7 / 67.0   |
|                 | Vol (mL)                 | 200            |
|                 | Cyl Dil Factor           | 1              |
|                 | Cyl Conc (ppmv)          | 243            |
|                 | Vol (mL NTP)             | 200            |
| Totals          | Sp Bag Vol L NTP         | 2.66           |
|                 | Corrected Initial (ppmv) | 1.62           |
|                 | Spike Amount (mL NTP)    | 0.0486         |
|                 | Spike Amount (ppmv)      | 18.3           |
|                 | Expected (ppmv)          | 19.9           |
| Result          | Inj1 (ppmv)              | 16.0           |
|                 | Inj2 (ppmv)              | 16.2           |
|                 | Inj3 (ppmv)              | 16.1           |
|                 | Avg (ppmv)               | 16.1           |
| <b>Recovery</b> |                          | <b>79.2%</b>   |

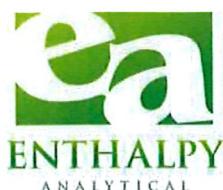
# Narrative Summary



# Enthalpy Analytical Narrative Summary

|                 |                                  |
|-----------------|----------------------------------|
| <b>Company</b>  | Air Monitoring Specialists, Inc. |
| <b>Job #</b>    | 0219-044 - EPA Method 18 (Bags)  |
| <b>Client #</b> | Lifenet Health – Concert Drive   |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Custody</b>                    | <p>David Myers received the samples on 2/7/19 after being relinquished by Air Monitoring Specialists, Inc. The bags were received at ambient temperature and in good condition.</p> <p>Prior to, during, and after analysis, the samples were kept under lock with access only to authorized personnel by Enthalpy Analytical, LLC.</p>                                                                                                                                                                                                                                                                                                  |
| <b>Analysis</b>                   | <p>The samples were analyzed for ethylene oxide using the analytical procedures in EPA Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography (40 CFR Part 60, Appendix A).</p> <p>All samples and standards were introduced directly to the column using an automated multi-port Valco gas sampling valve equipped with a stainless steel loop. Ethylene oxide was referenced to certified gas phase standards.</p> <p>The analyses were performed using the Agilent Technologies Model 6890N, Gas Chromatograph “Betty” (S/N US10430048) equipped with Flame Ionization Detector (FID).</p>                |
| <b>Calibration</b>                | <p>The calibration curves are located in the Raw Data section of this report and referenced in the Analysis Method column on the Detailed Results page.</p> <p>For each calibration curve used, the first page of the curve contains all method specific parameters (i.e., curve type, origin, weight, etc.) used to quantify the samples. The calibration curve section also includes a table with the Retention Time (RetTime), Level (Lvl), Amount (corresponding units), Area, Response Factor (Amt/Area) and the analyte Name. The calibration table is used to identify (by retention time) and quantify each target compound.</p> |
| <b>Chromatographic Conditions</b> | Copies of the acquisition methods (GC142P133_SHORT.M and GC142P133_CAL.M) are included in the Raw Data section of this report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



## Enthalpy Analytical Narrative Summary (continued)

### QC Notes

The analyses of the laboratory method blanks did not contain ethylene oxide at concentrations greater than the detection limit.

As required by the method, a spike and recovery study was performed on one of the samples from each source. Bag #2-2 was spiked on 2/11/19 at 10:36 AM, bag #1-4 was spiked on 2/11/19 at 10:52 AM, bag #1-6 D was spiked on 2/11/19 at 11:34 AM, and bag #3-1 BL was spiked on 2/11/19 at 12:32 PM, bag #3-3 BL was spiked on 2/11/19 at 1:35 PM, and bag #3-5 D was spiked on 2/11/19 at 3:08 PM. All recovery efficiency values met the method-required limits of 70 to 130%. The passing recovery efficiency values were used to adjust the associated sample results following equation 18-7 of Method 18.

### Reporting Notes

These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.

The results presented in this report are representative of the samples as provided to the laboratory.

## General Reporting Notes

The following are general reporting notes that are applicable to all Enthalpy Analytical, LLC data reports, unless specifically noted otherwise.

- Any analysis which refers to the method as “**Type**” represents a planned deviation from the reference method. For instance a Hydrogen Sulfide assay from a Tedlar bag would be labeled as “EPA Method 16-Type” because Tedlar bags are not mentioned as one of the collection options in EPA Method 16.
- The acronym **MDL** represents the Minimum Detection Limit. Below this value the laboratory cannot determine the presence of the analyte of interest reliably.
- The acronym **LOQ** represents the Limit of Quantification. Below this value the laboratory cannot quantitate the analyte of interest within the criteria of the method.
- The acronym **ND** following a value indicates a non-detect or analytical result below the MDL.
- The letter **J** in the Qualifier or Flag column in the results indicates that the value is between the MDL and the LOQ. The laboratory can positively identify the analyte of interest as present, but the value should be considered an estimate.
- The letter **E** in the Qualifier or Flag column indicates an analytical result exceeding 100% of the highest calibration point. The associated value should be considered as an estimate.
- Sample results are presented ‘as measured’ for single injection methodologies, or an average value if multiple injections are made. If all injections are below the MDL, the sample is considered non-detect and the ND value is presented. If one, but not all, are below the MDL, the MDL value is used for any injections that are below the MDL. For example, if the MDL is 0.500 and LOQ is 1.00, and the instrument measures 0.355, 0.620, and 0.442 - the result reported is the average of 0.500, 0.620, and 0.500 --- i.e. 0.540 with a J flag.
- When a spike recovery (Bag Spike, Collocated Spike Train, or liquid matrix spike) is being calculated, the native (unspiked) sample result is used in the calculations, as long as the value is above the MDL. If a sample is ND, then 0 is used as the native amount (not the MDL value).
- The acronym **DF** represents Dilution Factor. This number represents dilution of the sample during the preparation and/or analysis process. The analytical result taken from a laboratory instrument is multiplied by the DF to determine the final undiluted sample results.
- The addition of **MS** to the Sample ID represents a Matrix Spike. An aliquot of an actual sample is spiked with a known amount of analyte so that a percent recovery value can be determined. The MS analysis indicates what effect the sample matrix may have on the target analyte, i.e. whether or not anything in the sample matrix interferes with the analysis of the analyte(s).



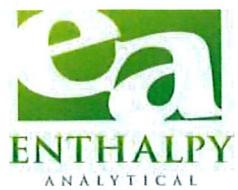
## General Reporting Notes

(continued)

- The addition of **MSD** to the Sample ID represents a Matrix Spike Duplicate. Prepared in the same manner as a MS, the use of duplicate matrix spikes allows further confirmation of laboratory quality by showing the consistency of results gained by performing the same steps multiple times.
- The addition of **LD** to the Sample ID represents a Laboratory Duplicate. The analyst prepares an additional aliquot of sample for testing and the results of the duplicate analysis are compared to the initial result. The result should have a difference value of within 10% of the initial result (if the results of the original analysis are greater than the LOQ).
- The addition of **AD** to the Sample ID represents an Alternate Dilution. The analyst prepares an additional aliquot at a different dilution factor (usually double the initial factor). This analysis helps confirm that no additional compound is present and coeluting or sharing absorbance with the analyte of interest, as they would have a different response/absorbance than the analyte of interest.
- The Sample ID **LCS** represents a Laboratory Control Sample. Clean matrix, similar to the client sample matrix, prepared and analyzed by the laboratory using the same reagents, spiking standards and procedures used for the client samples. The LCS is used to assess the control of the laboratory's analytical system. Whenever spikes are prepared for our client projects, two spikes are retained as LCSs. The LCSs are labeled with the associated project number and kept in-house at the appropriate temperature conditions. When the project samples are received for analysis, the LCSs are analyzed to confirm that the analyte could be recovered from the media, separate from the samples which were used on the project and which may have been affected by source matrix, sample collection, and/or sample transport.
- **Significant Figures:** Where the reported value is much greater than unity (1.00) in the units expressed, the number is rounded to a whole number of units, rather than to 3 significant figures. For example, a value of 10,456.45 ug carbon is rounded to 10,456 ug. There are five significant digits displayed, but no confidence should be placed on more than two significant digits. In the case of small numbers, generally 3 significant figures are presented, but still only 2 should be used with confidence. Many neat materials are only certified to 3 digits, and as the mathematically correct final result is always 1 digit less than all its pre-cursors - 2 significant figures are what are most defensible.
- **Manual Integration:** The data system is used for processing will flag manually integrated peaks with an "M". There are several reasons a peak may be manually integrated. These reasons will be identified by the following two letter designations on sample chromatograms, if provided in the report. The peak was **not integrated** by the software "**NI**", the peak was **integrated incorrectly** by the software "**II**" or the **wrong peak** was integrated by the software "**WP**". These codes will accompany the analyst's manual integration stamp placed next to the compound name on the chromatogram.



# Sample Custody





# Chain of Custody Record

Page 1 of 3

Client Name: Air Monitoring Specialists, Inc.  
Project Manager: Bruce Gerber  
Report To: Bruce Gerber  
Special Instructions:

Project Number:

Site Name: LifeNet Health  
Location: Concert Drive

Special Handling:  
 Standard Turn Around Time (10 business days)  
 Rush Turn Around Time – Date Needed \_\_\_\_\_  
 All TAT's Subject to Approval by Enthalpy Analytical, Inc.  
 All BagICan Samples Disposed of 1 Month from Receipt  
 All Other Samples Disposed of 4 Months from Receipt

| Sample ID          | Date | Time   | Volume | Sample Type     | Matrix | # of VOA Vials | # of Glass | # of Plastic                  | # of Bags | # of Canisters                              | # of Tubes | # Other                     | Analyses:                                                                                 |  | Notes: |  |
|--------------------|------|--------|--------|-----------------|--------|----------------|------------|-------------------------------|-----------|---------------------------------------------|------------|-----------------------------|-------------------------------------------------------------------------------------------|--|--------|--|
|                    |      |        |        |                 |        |                |            |                               |           |                                             |            |                             | For spiked or duplicate samples: Please provide sample volumes for recovery calculations. |  |        |  |
| # 1-1              | 2/6  | 8:48   | 10L    | C               | A      | X              |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 1-2              | 2/6  | 8:48   | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 2-1              | 2/6  | 8:55   | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 2-2              | 2/6  | 8:55   | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 3-1              | 2/6  | 9:03   | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 3-2              | 2/6  | 9:03   | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 1-3              | 2/6  | 11:34  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 1-4              | 2/6  | 11:34  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 2-3              | 2/6  | 11:31  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 2-4              | 2/6  | 11:31  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 3-3              | 2/6  | 11:42  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 3-4              | 2/6  | 11:42  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 1-5              | 2/6  | 14:40  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| # 1-6              | 2/6  | 14:40  | 10L    | C               | A      |                |            |                               |           |                                             |            |                             |                                                                                           |  |        |  |
| Relinquished By:   |      | Date:  |        | Received By:    |        | Date:          |            | Time:                         |           | Sample Condition Upon Receipt:              |            |                             |                                                                                           |  |        |  |
| <i>Phil Gerber</i> |      | 2/6/19 |        | <i>Dan Wynn</i> |        | 02-07-19       | 9:30 AM    | <input type="checkbox"/> Iced |           | <input checked="" type="checkbox"/> Ambient |            | <input type="checkbox"/> °C |                                                                                           |  |        |  |
|                    |      |        |        |                 |        |                |            | <input type="checkbox"/> Iced |           | <input checked="" type="checkbox"/> Ambient |            | <input type="checkbox"/> °C |                                                                                           |  |        |  |
|                    |      |        |        |                 |        |                |            | <input type="checkbox"/> Iced |           | <input checked="" type="checkbox"/> Ambient |            | <input type="checkbox"/> °C |                                                                                           |  |        |  |



# Chain of Custody Record

Page 2 of 3

Client Name: Air Monitoring Specialists, Inc.

Project Number:

*Life Net Health*

Site Name:

*Glencoe Drive*

Location:

*Glencoe Drive*

Special Instructions:

A=Air 1=H<sub>2</sub>SO<sub>4</sub> 2=NaOH 3=

4=

X=XAD C=Charcoal SG=Silica Gel

G=Grab C=Composite Q=Quality Control

| Sample ID | Date | Time | Volume | Sample Type | Matrix |
|-----------|------|------|--------|-------------|--------|
|-----------|------|------|--------|-------------|--------|

|         |     |       |     |   |   |
|---------|-----|-------|-----|---|---|
| # 2-5   | 2/6 | 14:12 | 10L | C | A |
| # 2-6   | 2/6 | 14:12 | 10L | C | A |
| # 3-5   | 2/6 | 14:21 | 10L | C | A |
| # 3-6   | 2/6 | 14:21 | 10L | C | A |
| # 1-1 D | 2/6 | 8:48  | 5L  | C | A |
| # 1-2 D | 2/6 | 8:48  | 5L  | C | A |
| # 2-1 D | 2/6 | 8:55  | 5L  | C | A |
| # 2-2 D | 2/6 | 8:55  | 5L  | C | A |
| # 3-1 D | 2/6 | 9:03  | 5L  | C | A |
| # 3-2 D | 2/6 | 9:03  | 5L  | C | A |
| # 1-3 D | 2/6 | 11:34 | 5L  | C | A |
| # 1-4 D | 2/6 | 11:34 | 5L  | C | A |
| # 2-3 D | 2/6 | 11:31 | 5L  | C | A |
| # 2-4 D | 2/6 | 11:31 | 5L  | C | A |

Notes:

For spiked or duplicate samples: please provide sample volumes for recovery calculations.

For particulars: please provide bare weights and/or condensed water volumes.

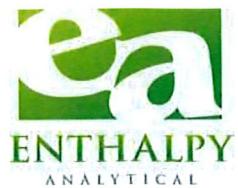
| Sample ID | Date | Time  | Volume | Sample Type | Matrix | # of VOA Vials | # of Glass | # of Plastic | # of Bags | # of Canisters | # of Tubes | # Other | Notes: | Analyses: | Sample Condition Upon Receipt: | Date: | Time: | Received By: | Relinquished By: |
|-----------|------|-------|--------|-------------|--------|----------------|------------|--------------|-----------|----------------|------------|---------|--------|-----------|--------------------------------|-------|-------|--------------|------------------|
| # 2-5     | 2/6  | 14:12 | 10L    | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 2-6     | 2/6  | 14:12 | 10L    | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 3-5     | 2/6  | 14:21 | 10L    | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 3-6     | 2/6  | 14:21 | 10L    | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 1-1 D   | 2/6  | 8:48  | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 1-2 D   | 2/6  | 8:48  | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 2-1 D   | 2/6  | 8:55  | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 2-2 D   | 2/6  | 8:55  | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 3-1 D   | 2/6  | 9:03  | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 3-2 D   | 2/6  | 9:03  | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 1-3 D   | 2/6  | 11:34 | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 1-4 D   | 2/6  | 11:34 | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 2-3 D   | 2/6  | 11:31 | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |
| # 2-4 D   | 2/6  | 11:31 | 5L     | C           | A      | 1              | 1          | 1            | 1         | 1              | 1          | 1       | X      |           |                                |       |       |              |                  |



## Chain of Custody Record

Page 3 of 3

# Raw Data

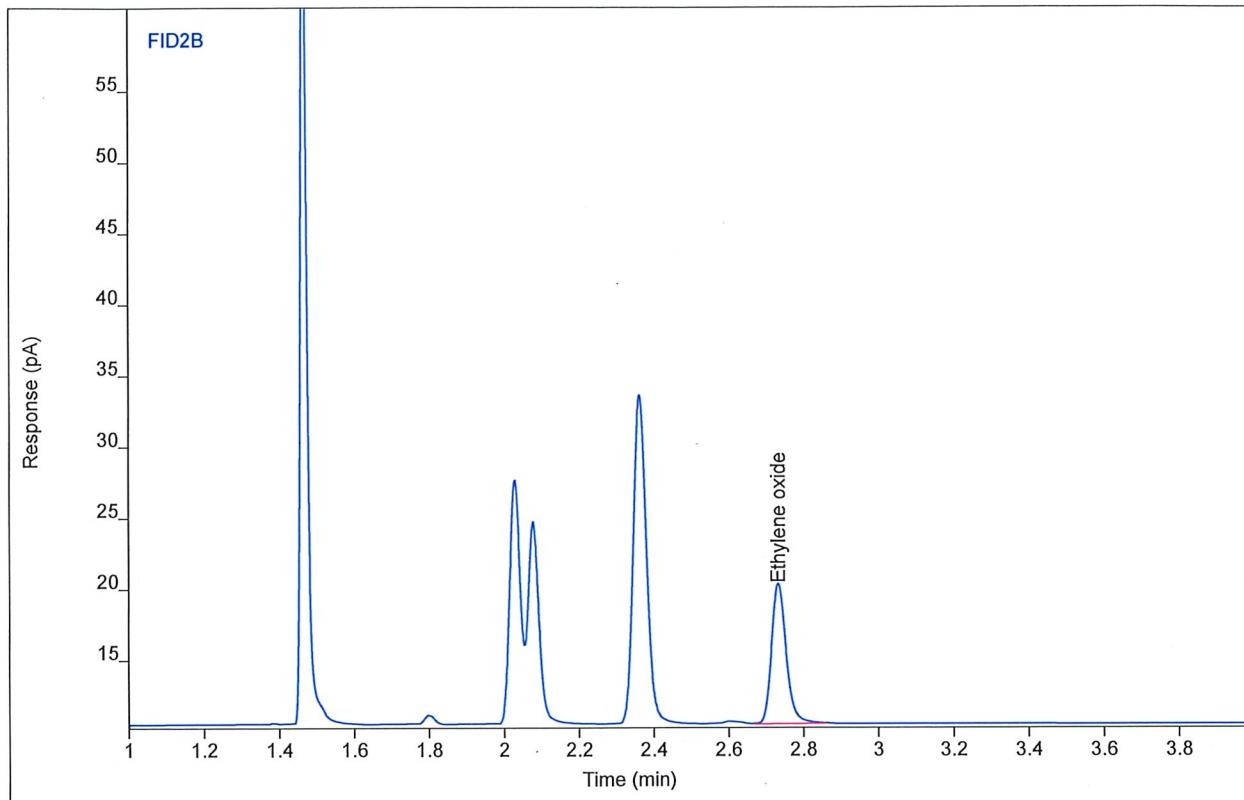


# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1029 ver.3  
Inj Data File 025B0101.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:35 AM  
File Modified 2/14/2019 11:18 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



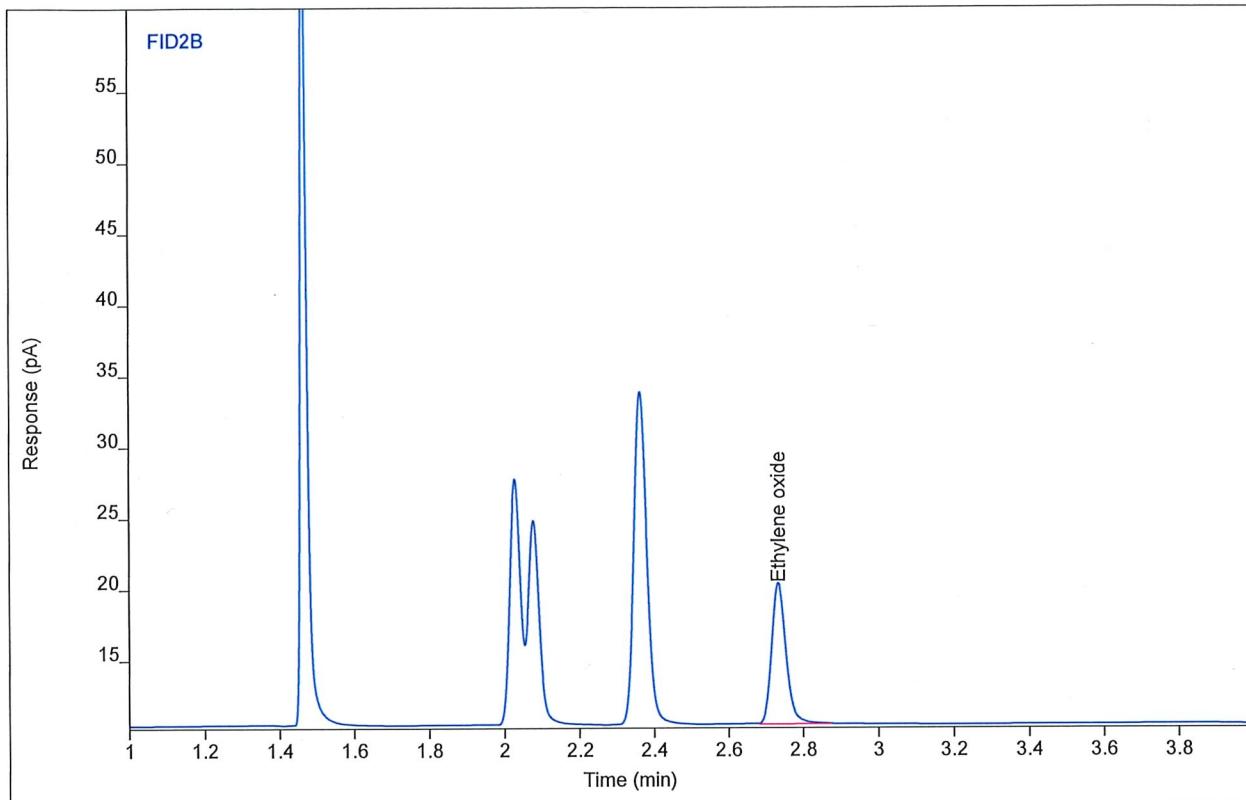
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | VB   | 2.73 | 26.6351 | 9.85863 | 75.8154 | 1  | 75.8154 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1029 ver.3  
Inj Data File 025B0102.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:47 AM  
File Modified 2/14/2019 11:18 AM  
Instrument  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



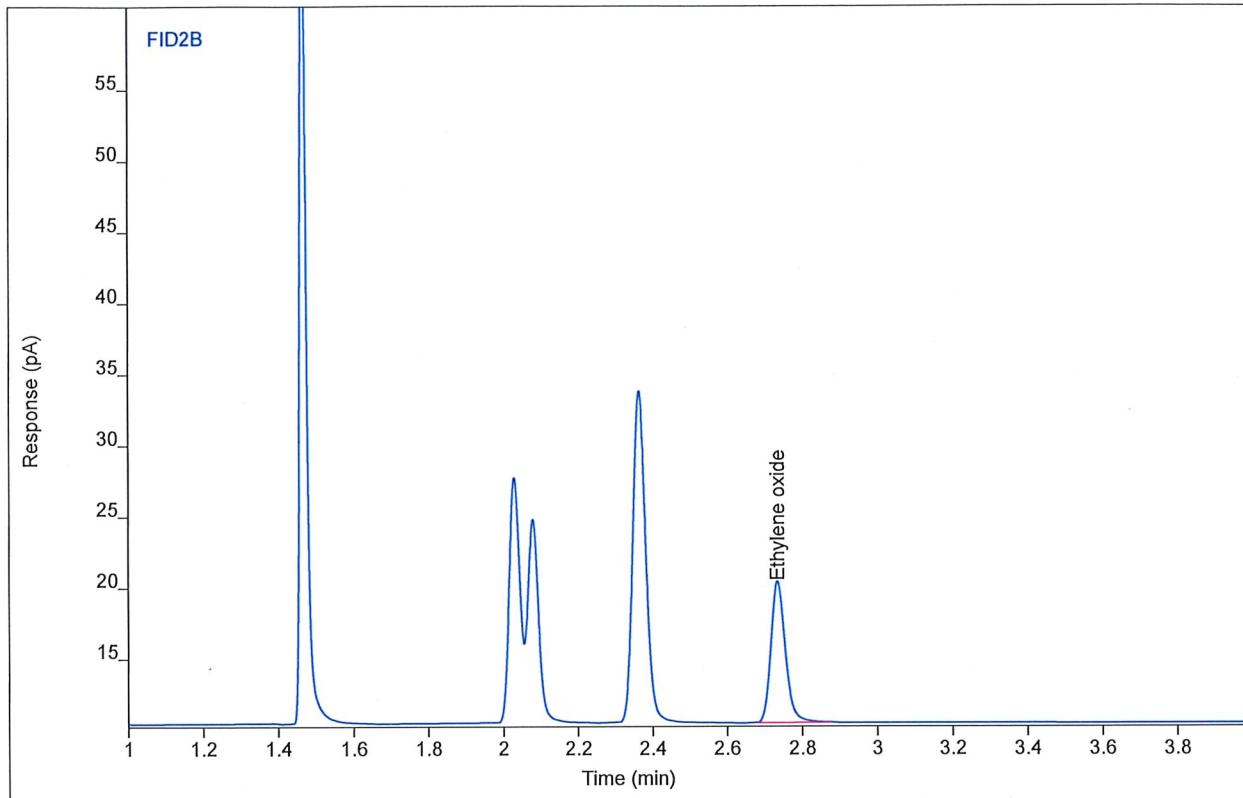
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 26.9394 | 9.94203 | 76.6811 | 1  | 76.6811 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1029 ver.3  
Inj Data File 025B0103.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 8:15 AM  
File Modified 2/14/2019 11:18 AM  
Instrument  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



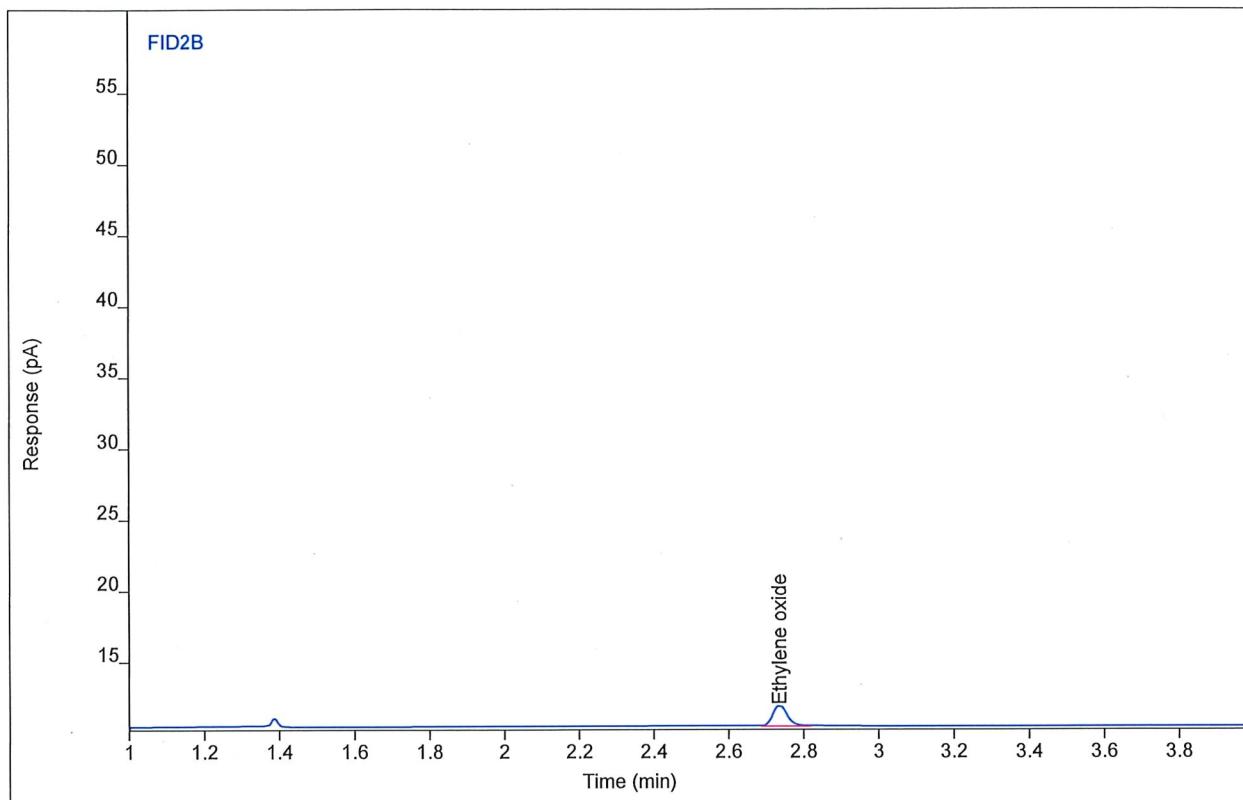
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 27.0040 | 9.95495 | 76.8648 | 1  | 76.8648 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 2-4.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 019B0701.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 10:42 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



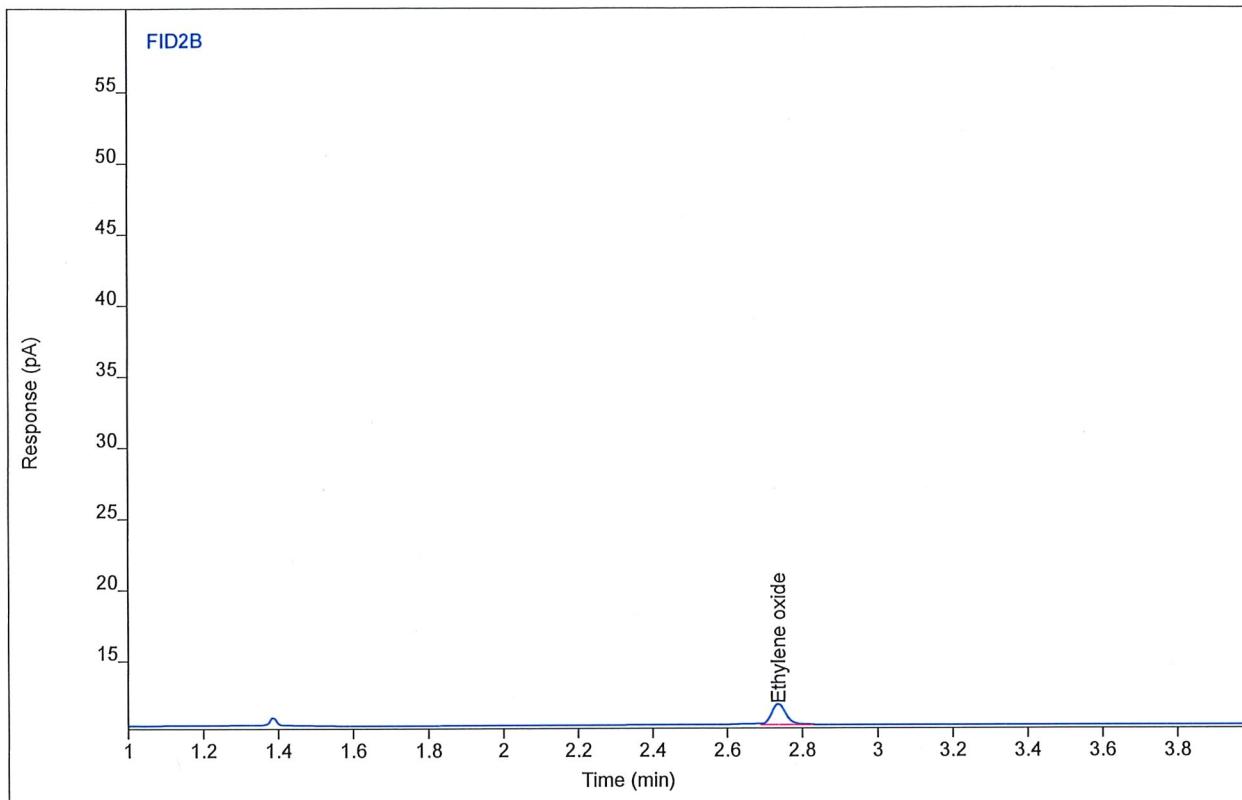
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 3.92861 | 1.46427 | 11.2138 | 1  | 11.2138 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 2-4.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 019B0702.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 10:50 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



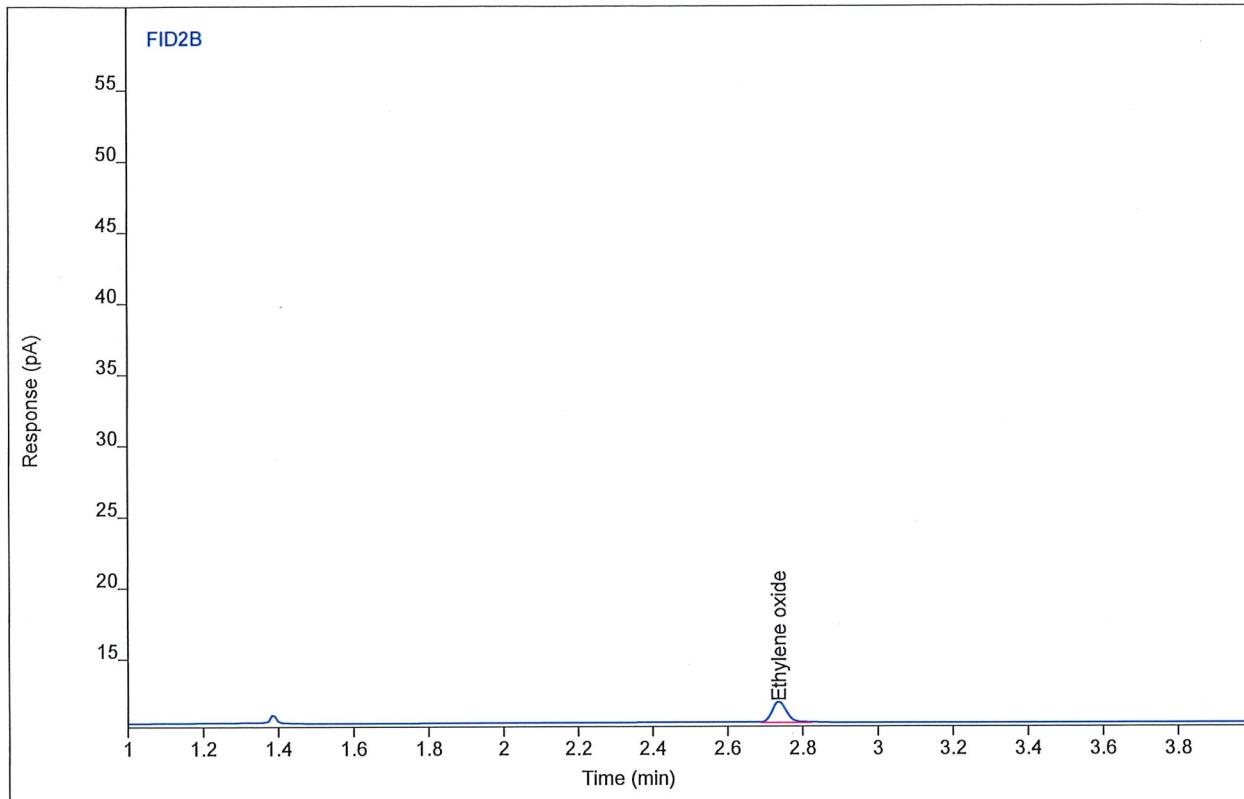
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 3.93465 | 1.46955 | 11.2310 | 1  | 11.2310 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 2-4.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 019B0703.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 10:58 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



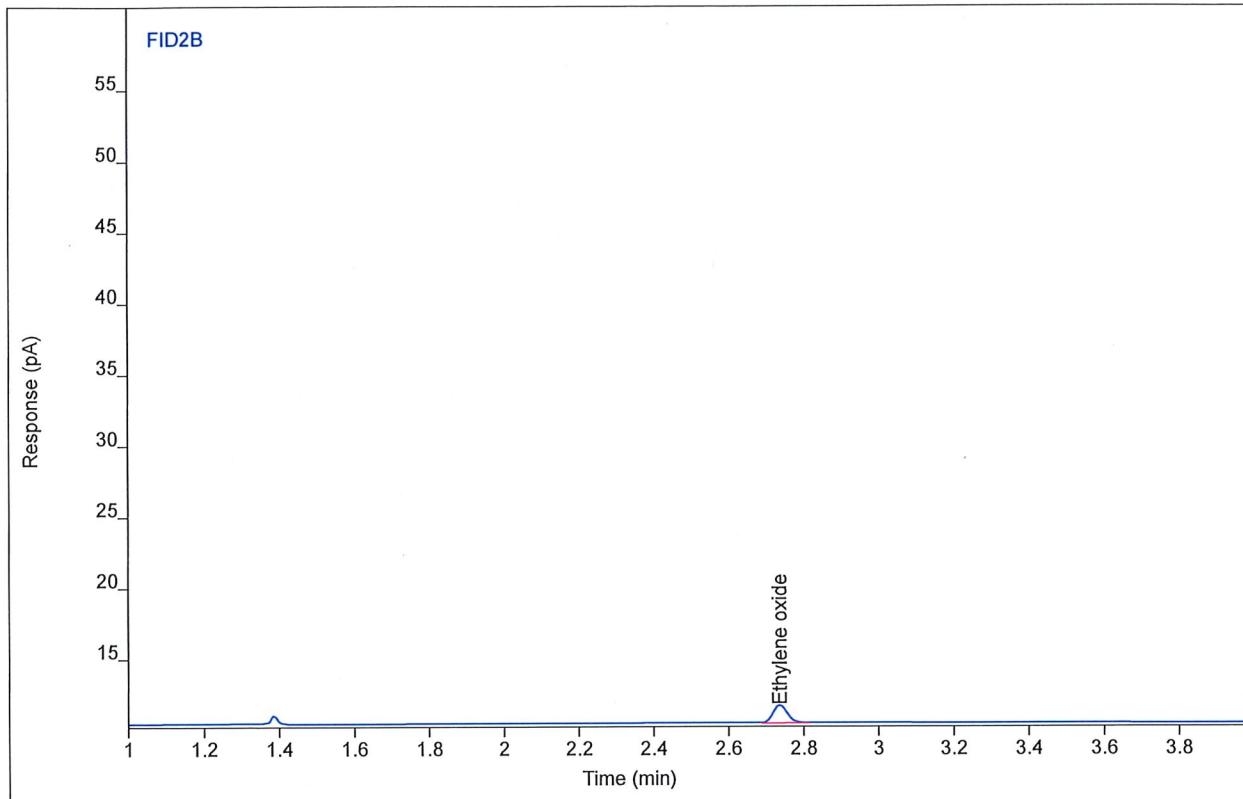
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 3.94336 | 1.47155 | 11.2558 | 1  | 11.2558 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-6.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 020B0801.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:05 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



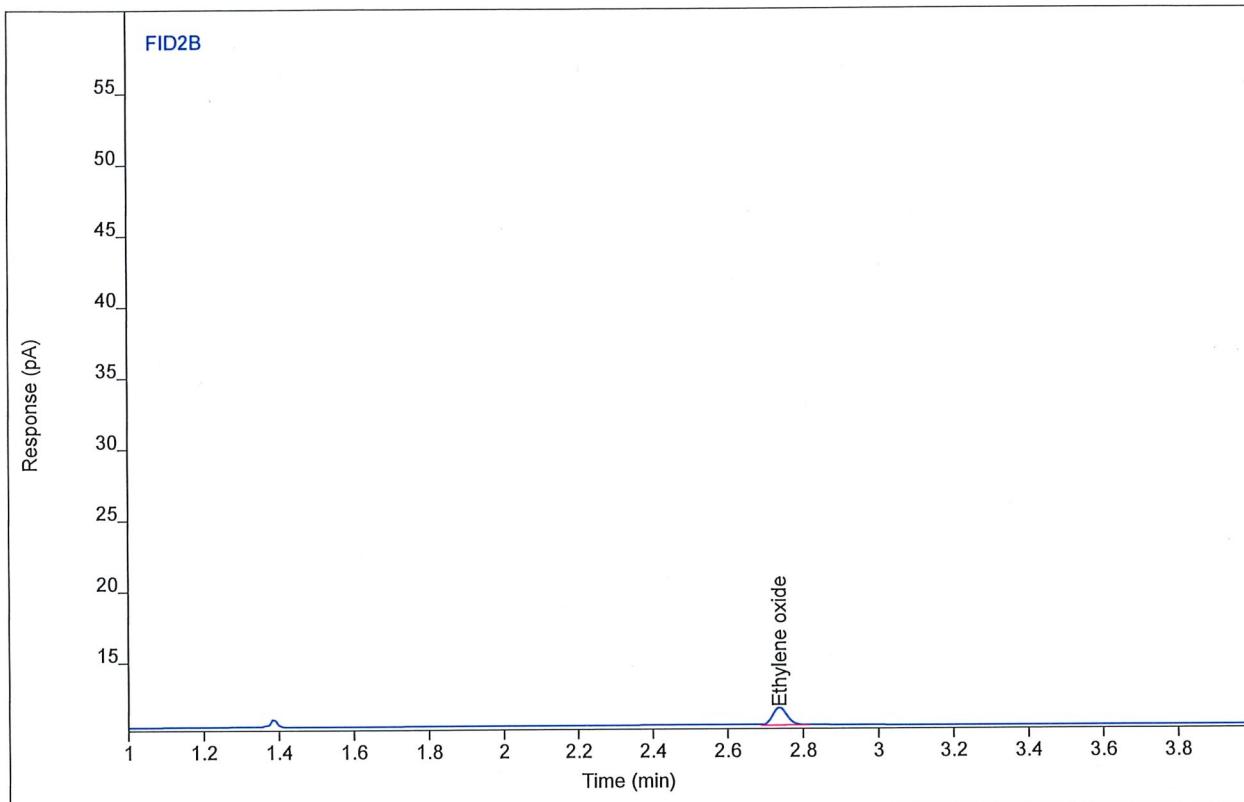
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 3.36144 | 1.25000 | 9.60017 | 1  | 9.60017 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-6.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 020B0802.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:13 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



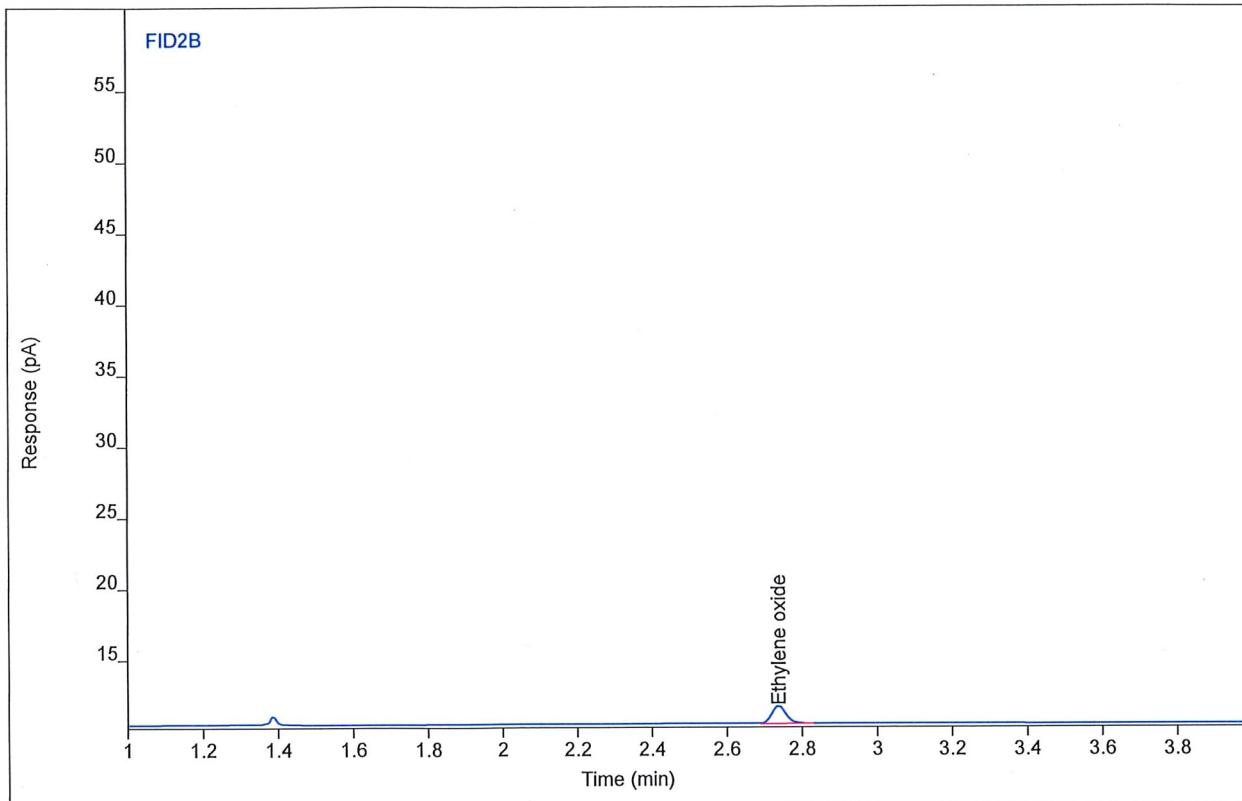
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 3.37584 | 1.26844 | 9.64113 | 1  | 9.64113 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-6.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 020B0803.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:21 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



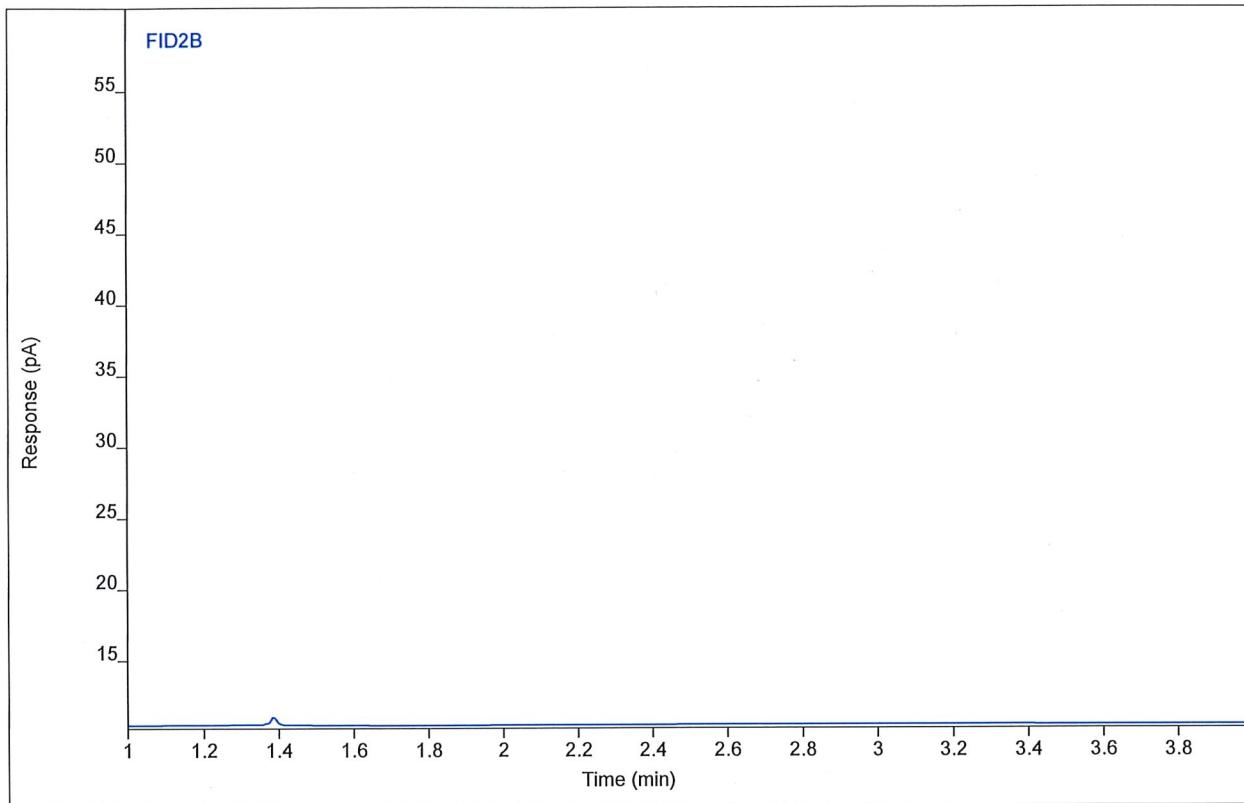
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 3.38925 | 1.25886 | 9.67929 | 1  | 9.67929 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 2-6.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 023B0901.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:28 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 23  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



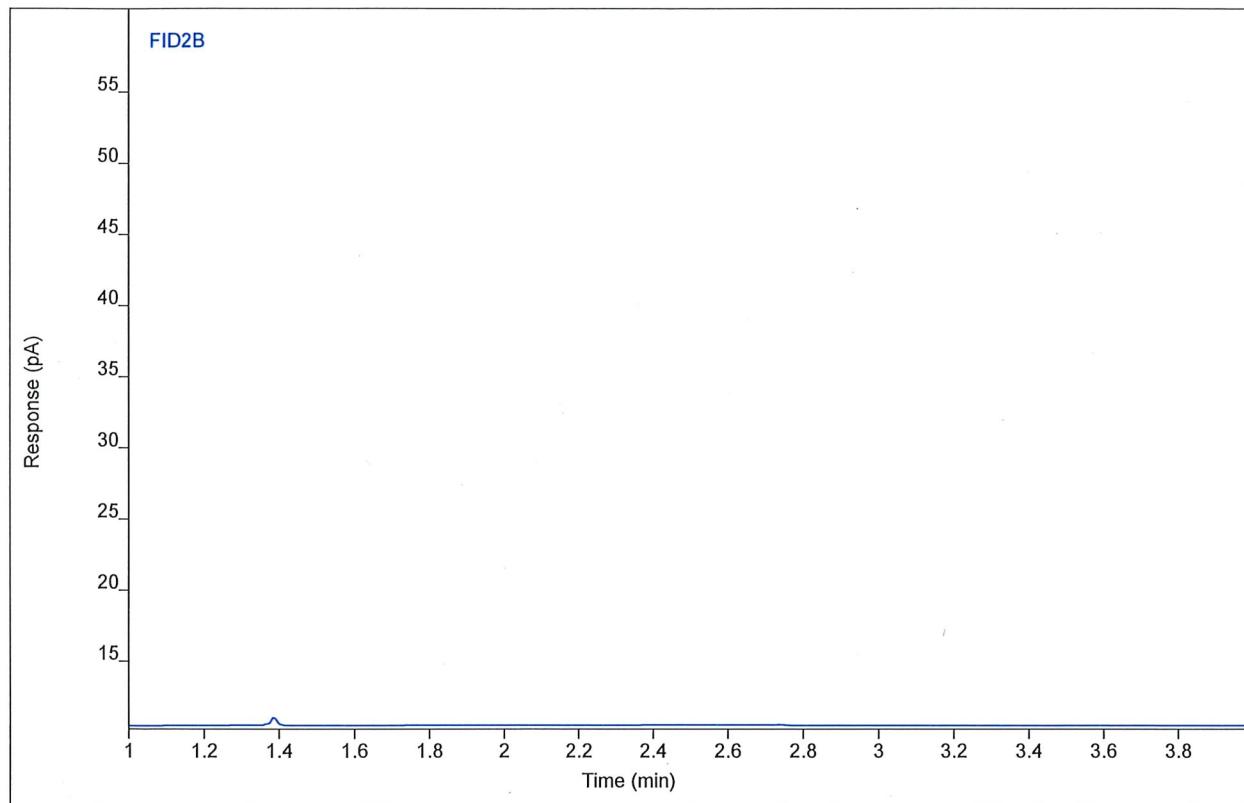
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

## Chromatogram Report

Sample Name 0219-044.Out 2-6.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 023B0902.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:36 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

## Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 23  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



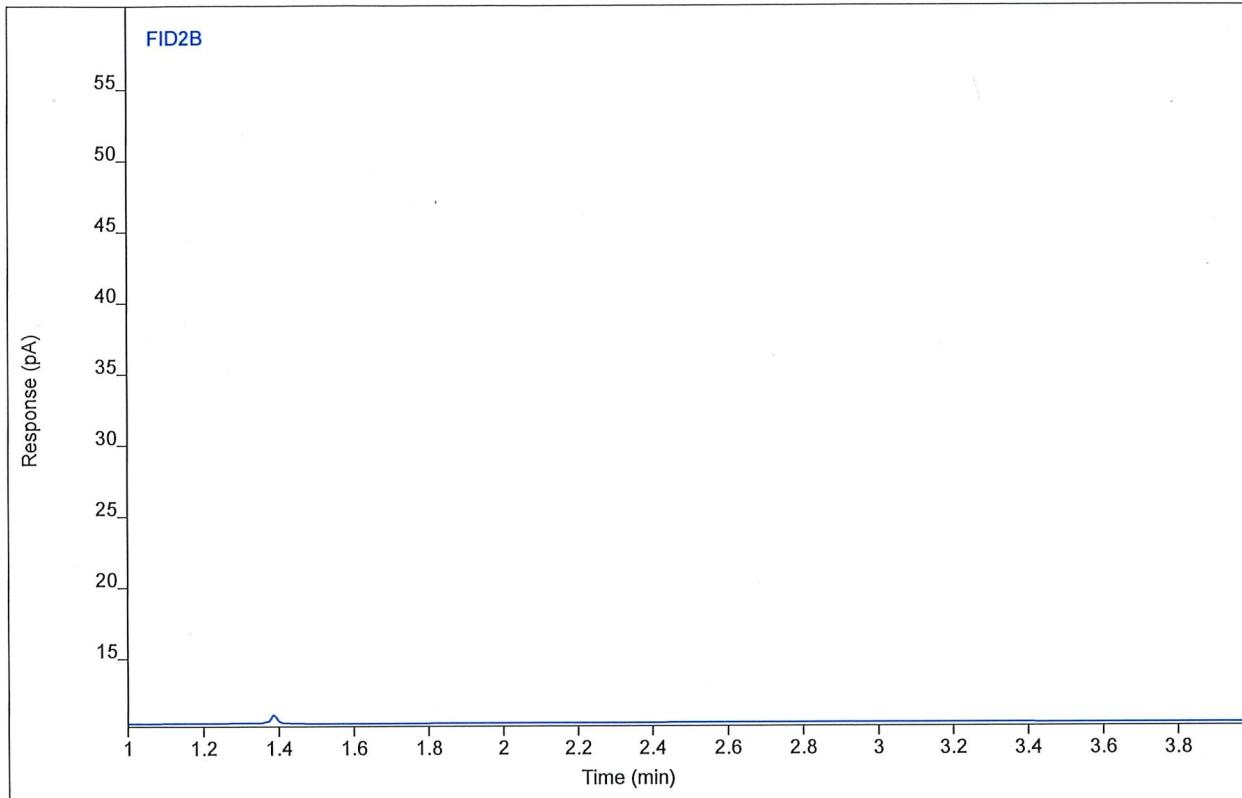
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        |    | 1       |      |

# Chromatogram Report

Sample Name 0219-044.Out 2-6.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 023B0903.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:43 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 23  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



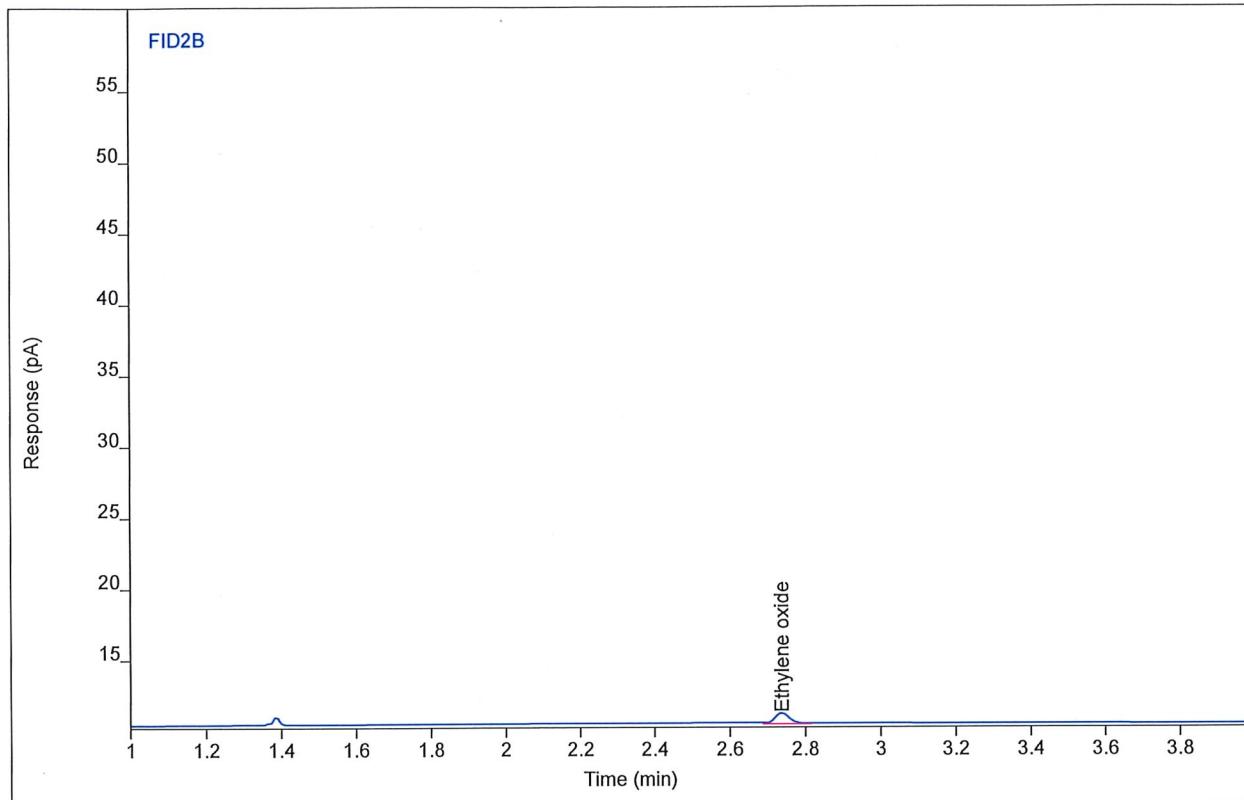
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

## Chromatogram Report

Sample Name 0219-044.Out 3-4.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 030B1002.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:59 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

## Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 30  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



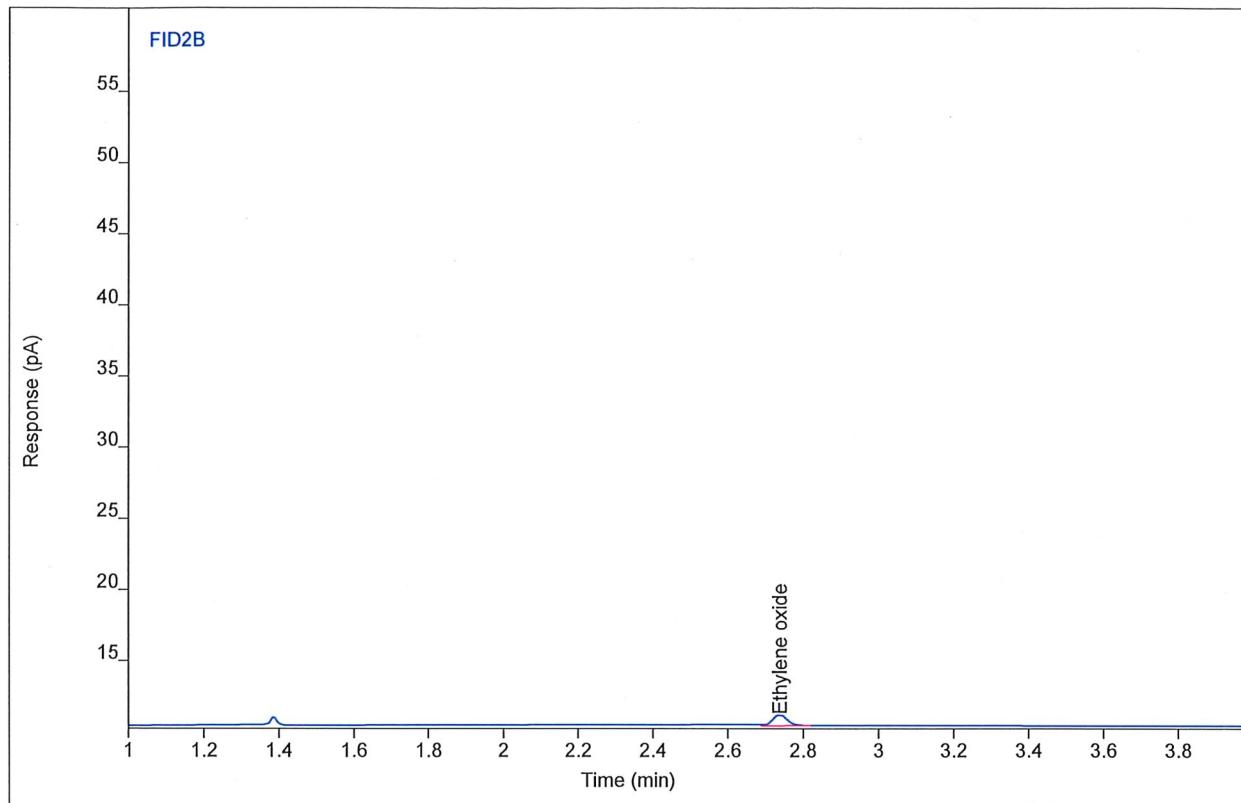
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 2.10963 | 0.79202 | 6.03869 | 1  | 6.03869 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-4.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 030B1001.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 11:51 AM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 30  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



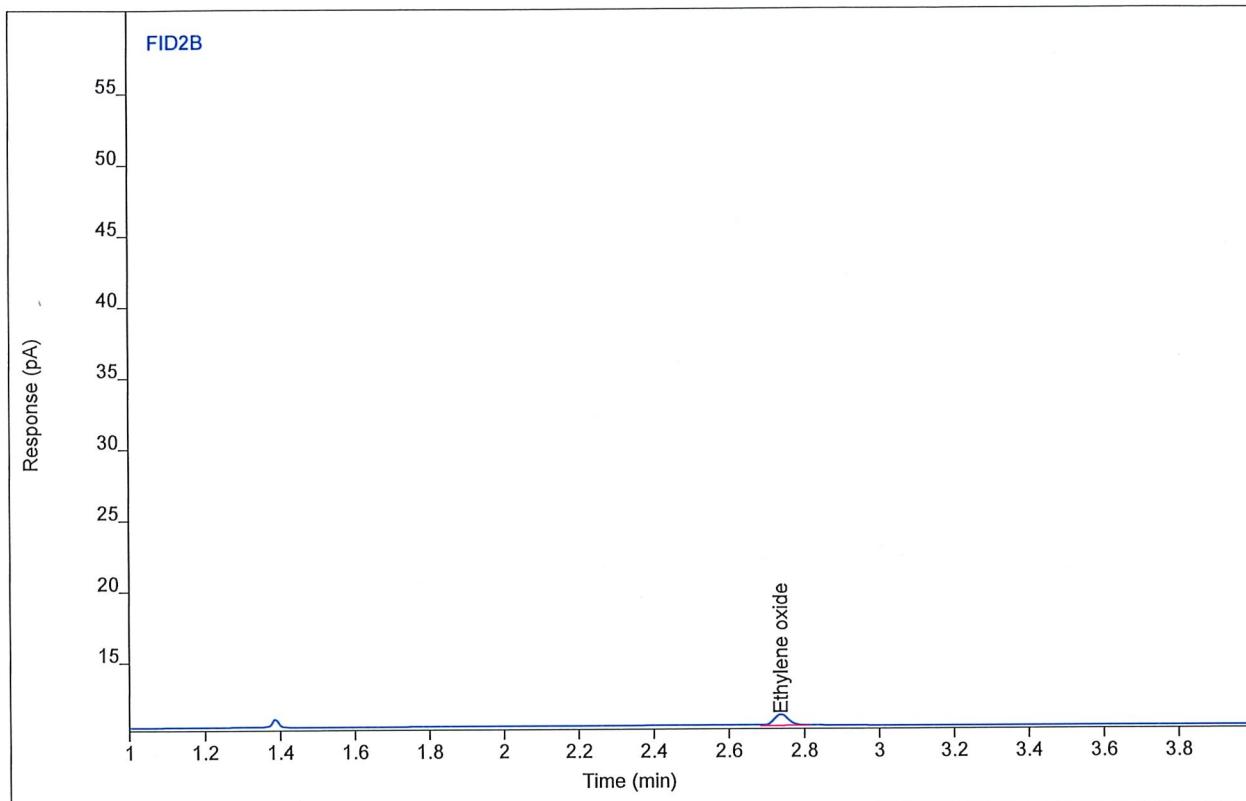
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 2.10461 | 0.77711 | 6.02441 | 1  | 6.02441 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-4.Bag  
Sequence Name BETTYP1029 ver.3  
Inj Data File 030B1003.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 12:06 PM  
File Modified 2/14/2019 11:19 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 30  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



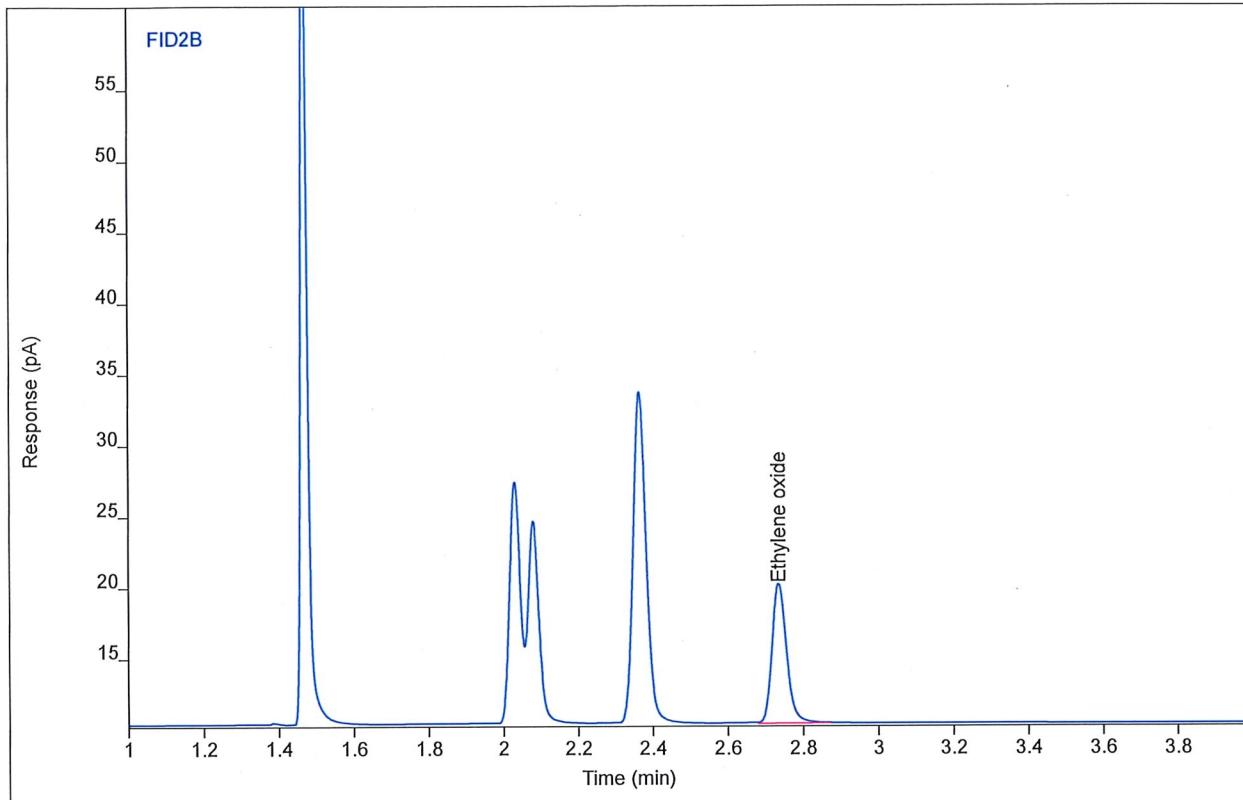
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 2.13137 | 0.78649 | 6.10054 | 1  | 6.10054 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1029 ver.3  
Inj Data File 025B1701.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 1:34 PM  
File Modified 2/14/2019 11:20 AM  
Instrument Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 1 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



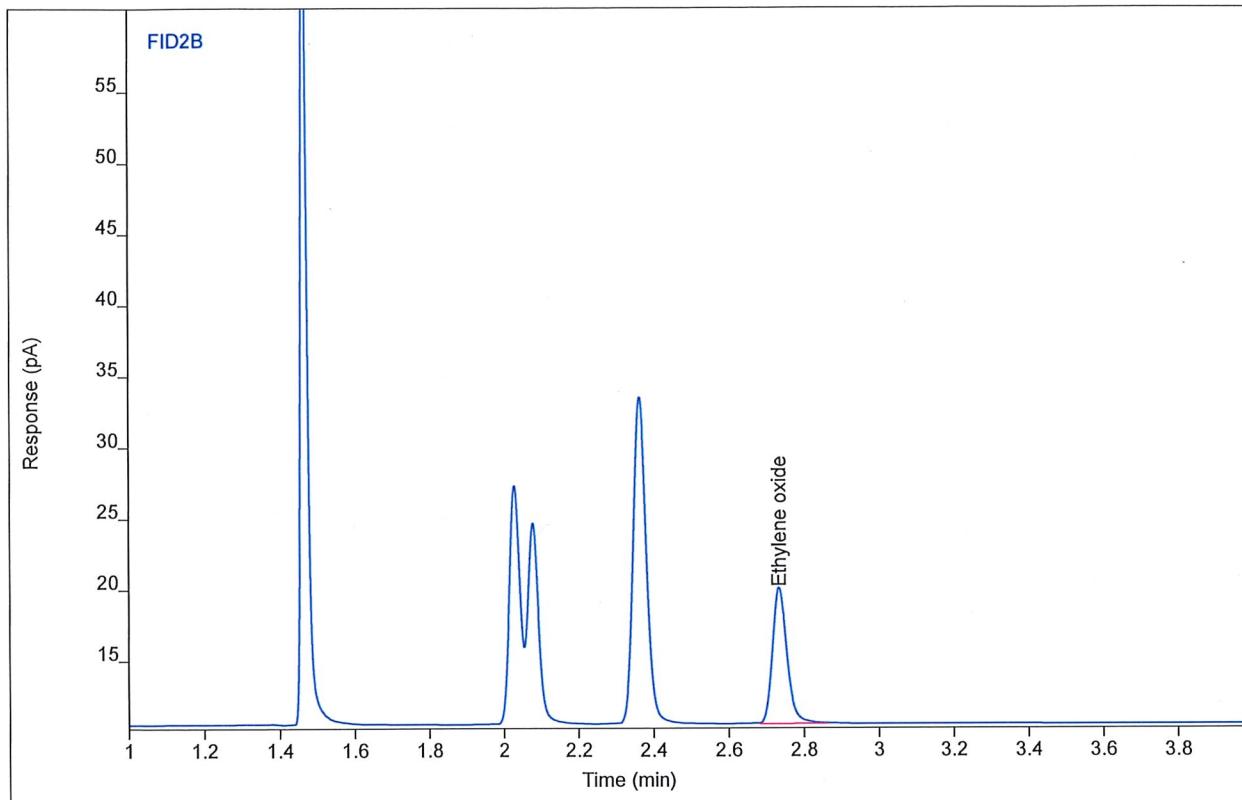
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 26.4582 | 9.84533 | 75.3119 | 1  | 75.3119 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1029 ver.3  
Inj Data File 025B1702.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 1:59 PM  
File Modified 2/14/2019 11:20 AM  
Instrument Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



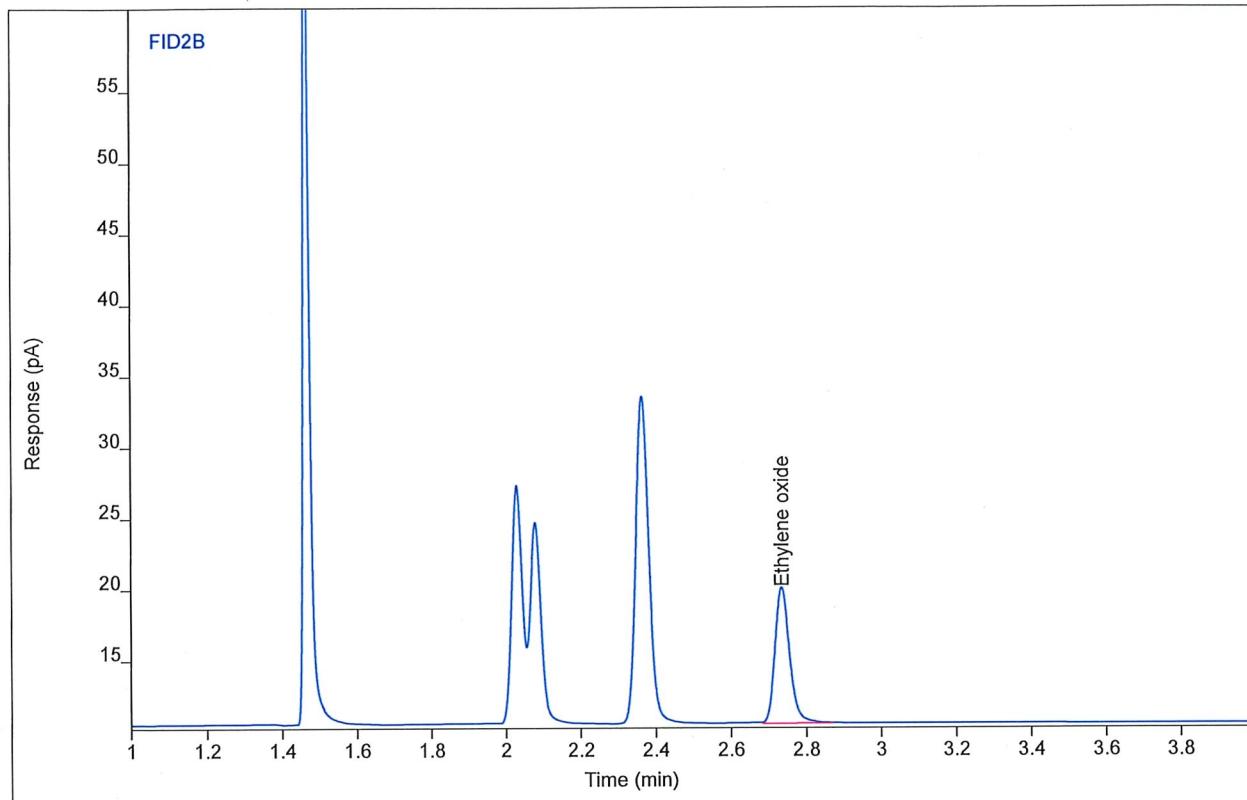
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 25.7623 | 9.57694 | 73.3321 | 1  | 73.3321 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1029 ver.3  
Inj Data File 025B1703.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 2:24 PM  
File Modified 2/14/2019 11:20 AM  
Instrument Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 2/14/2019 11:18 AM  
Printed 2/15/2019 9:18 AM



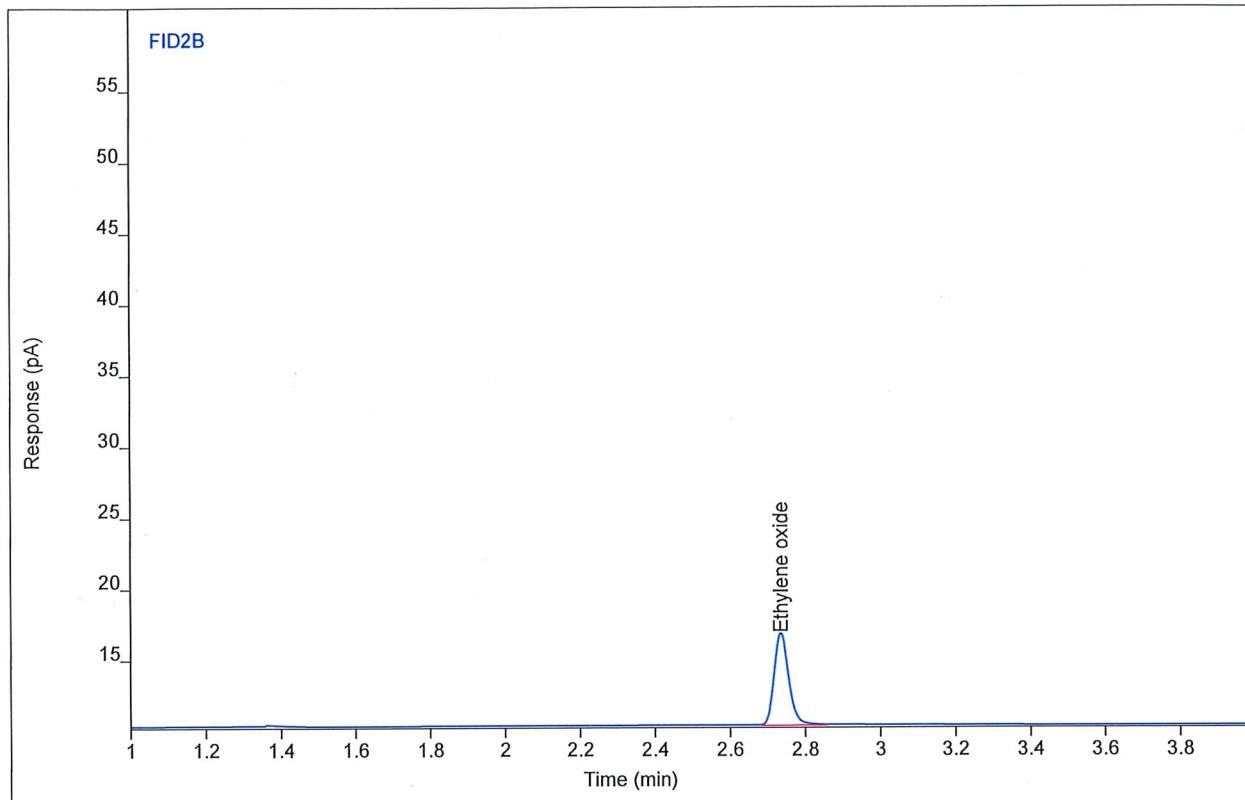
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 25.8387 | 9.56792 | 73.5495 | 1  | 73.5495 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-5.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 026B0601.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:05 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 26  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



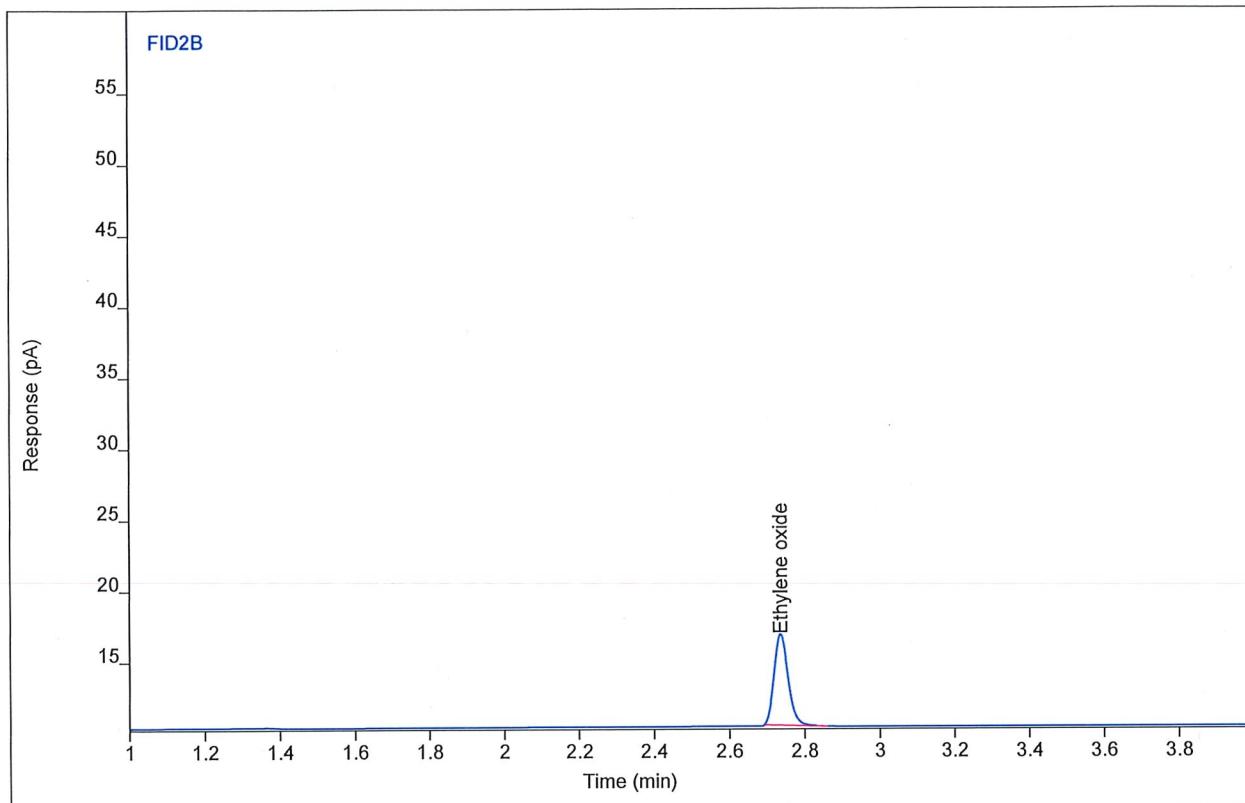
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 17.4471 | 6.48358 | 49.6748 | 21 | 1043.17 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-5.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 026B0602.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:12 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 26  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



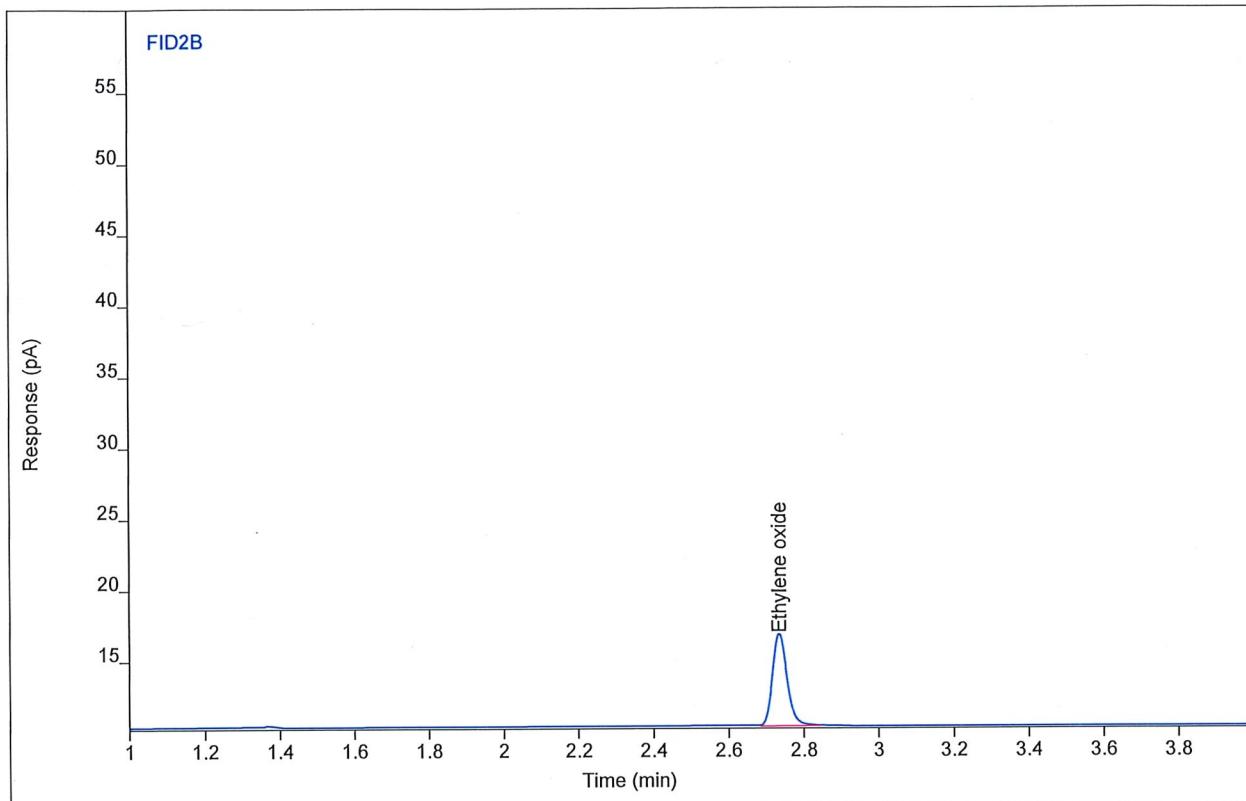
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 16.6829 | 6.40450 | 47.5006 | 21 | 997.512 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-5.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 026B0603.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:20 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 26  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



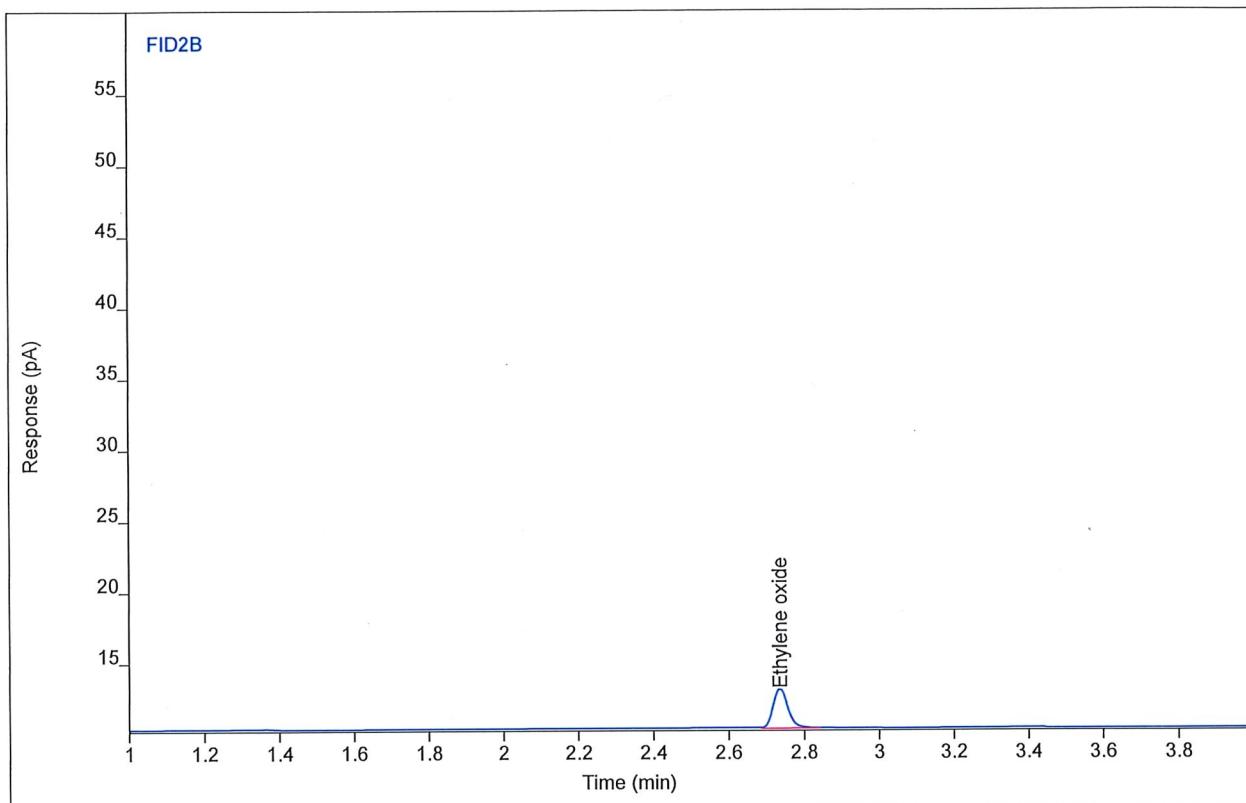
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 17.4241 | 6.51139 | 49.6095 | 21 | 1041.80 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 027B0701.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:27 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 27  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



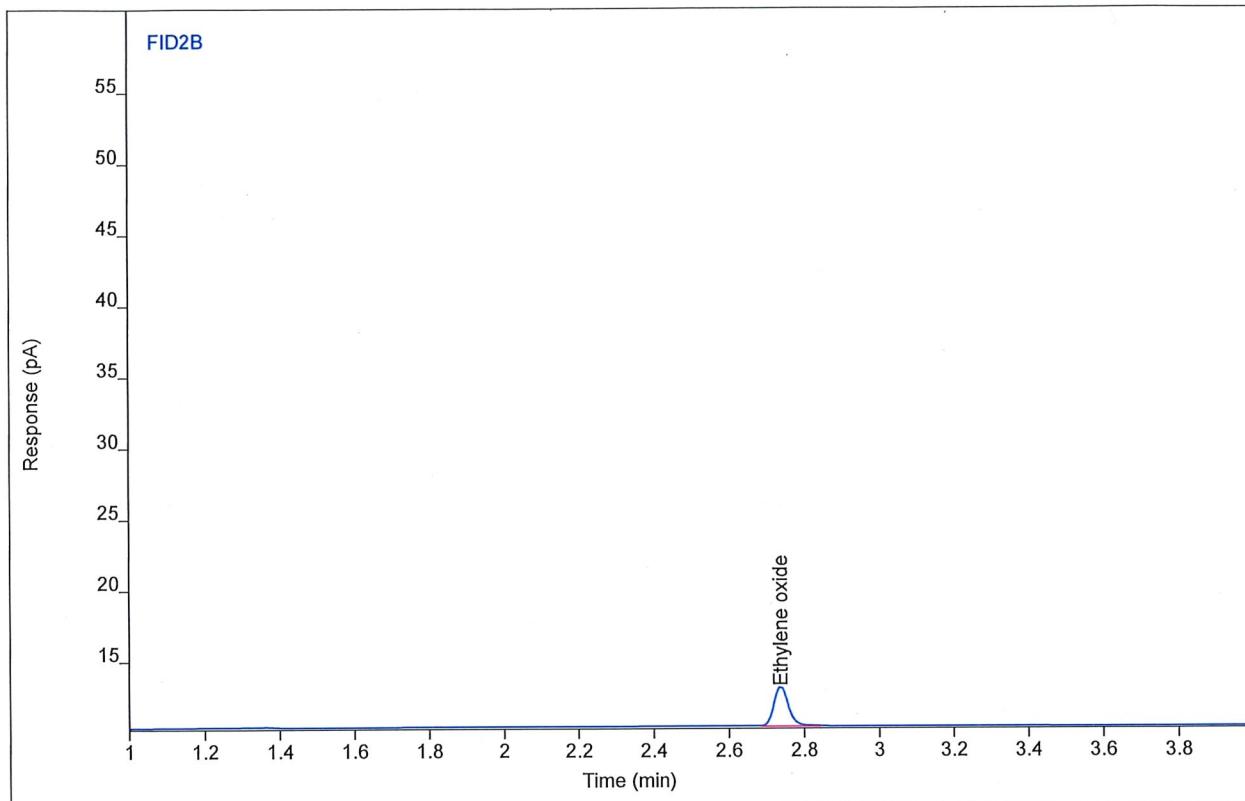
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 7.57165 | 2.80047 | 21.5785 | 21 | 453.149 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 027B0702.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:35 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 27  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



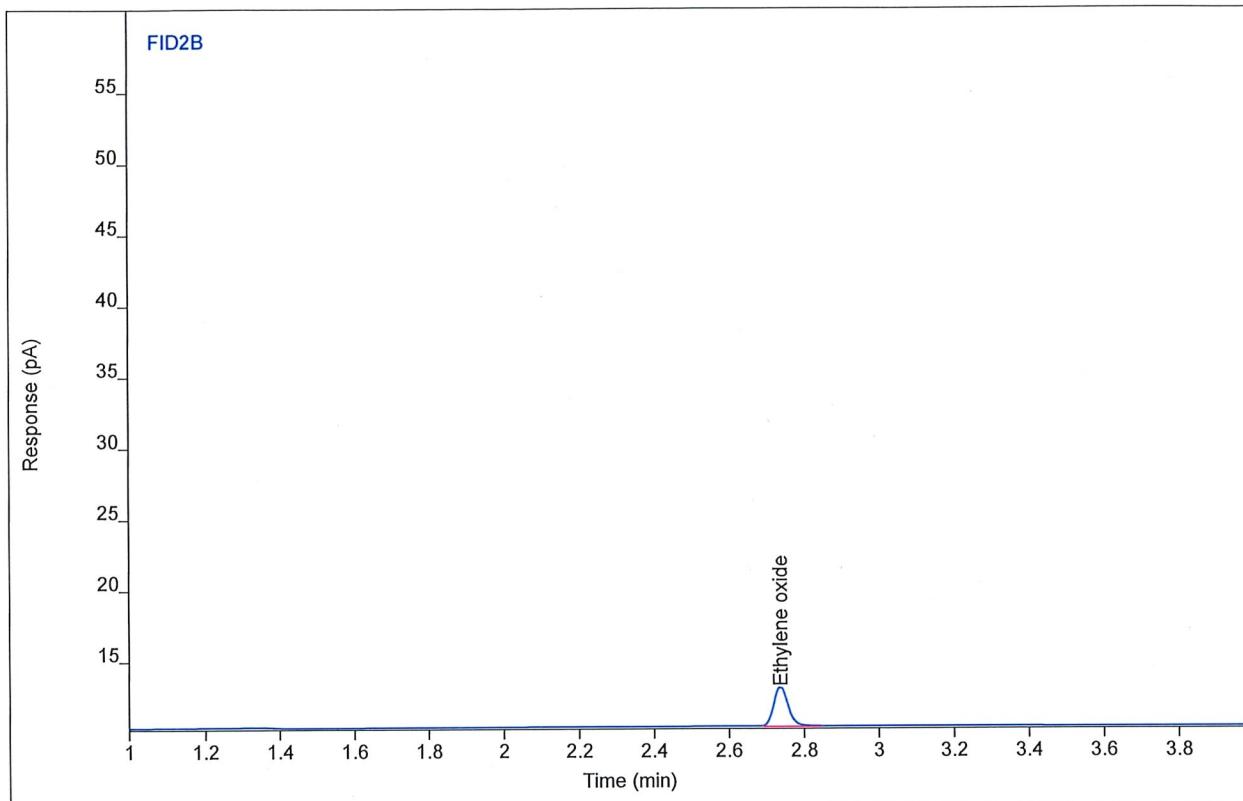
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 7.56655 | 2.80237 | 21.5640 | 21 | 452.844 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 027B0703.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:43 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 27  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



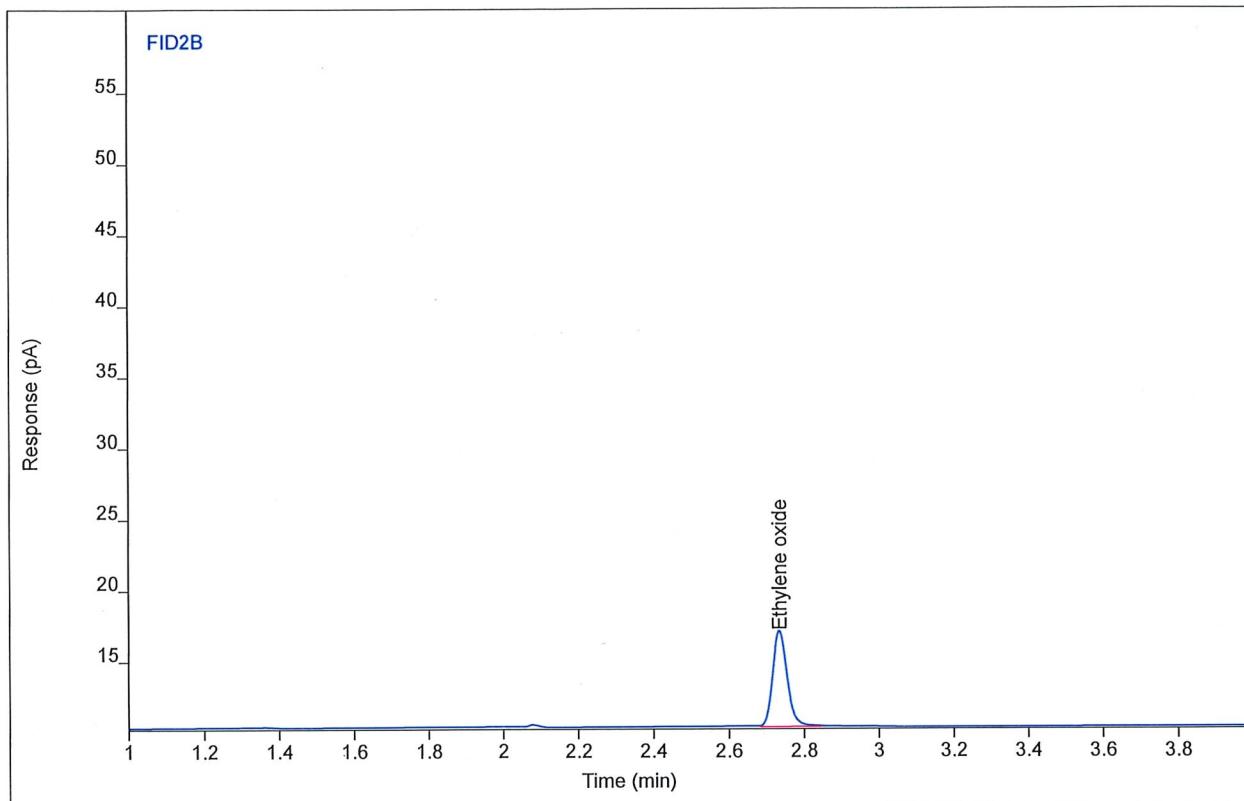
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 7.58658 | 2.79930 | 21.6210 | 21 | 454.040 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 029B0801.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:50 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 29  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



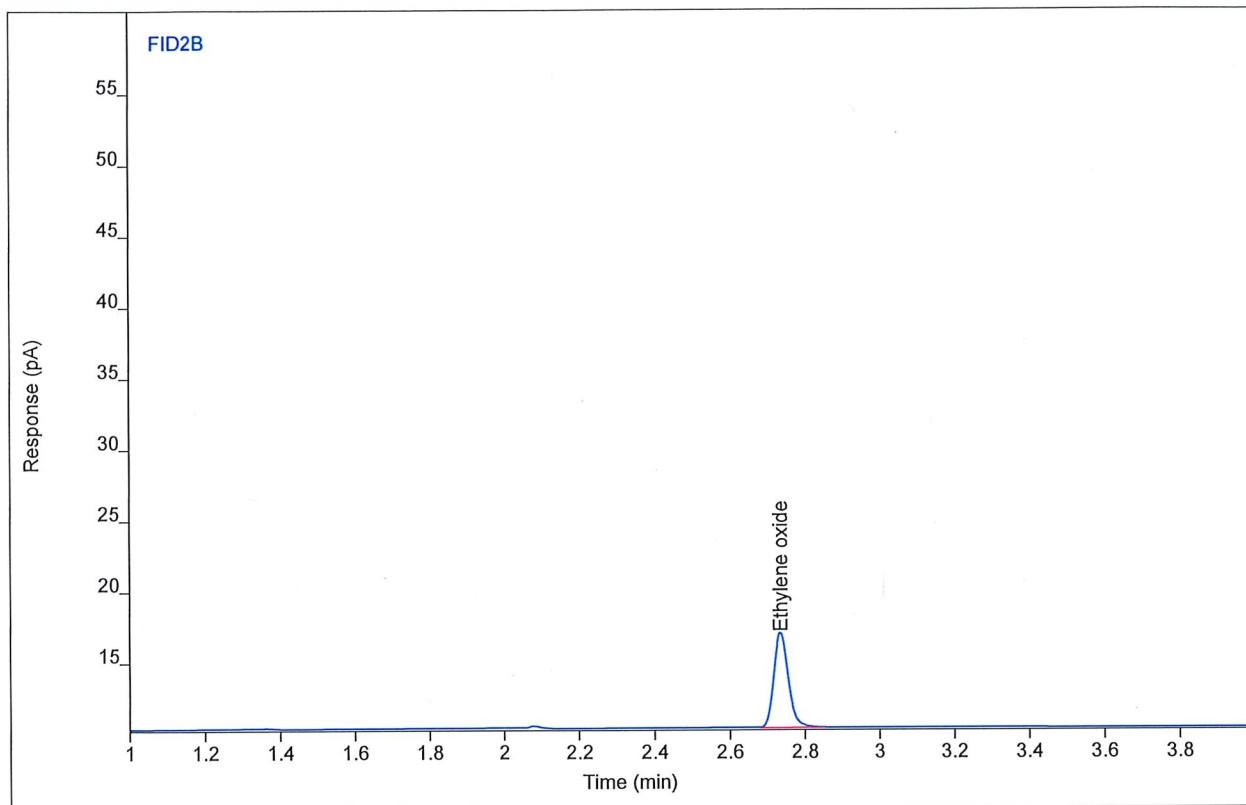
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 18.0680 | 6.74378 | 51.4413 | 21 | 1080.27 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 029B0802.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 4:58 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 29  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



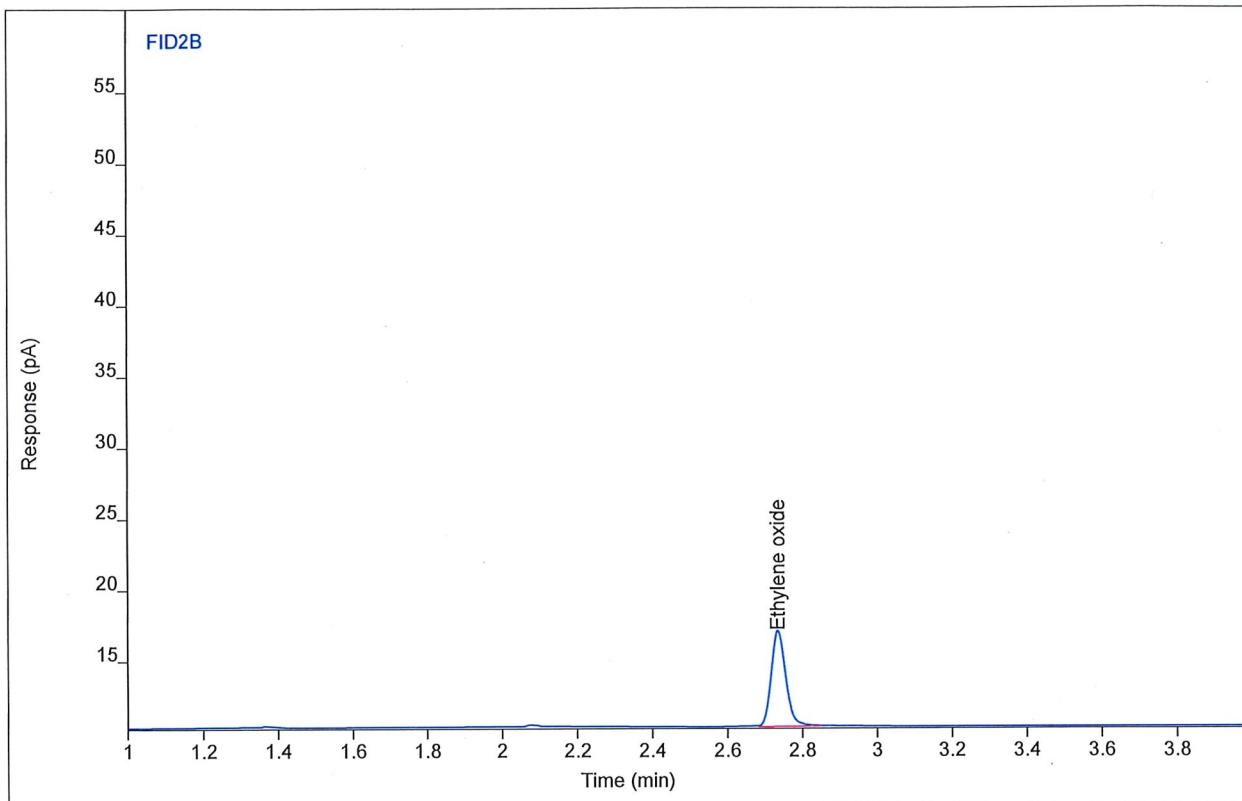
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 18.0768 | 6.72889 | 51.4665 | 21 | 1080.80 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 029B0803.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:05 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 29  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



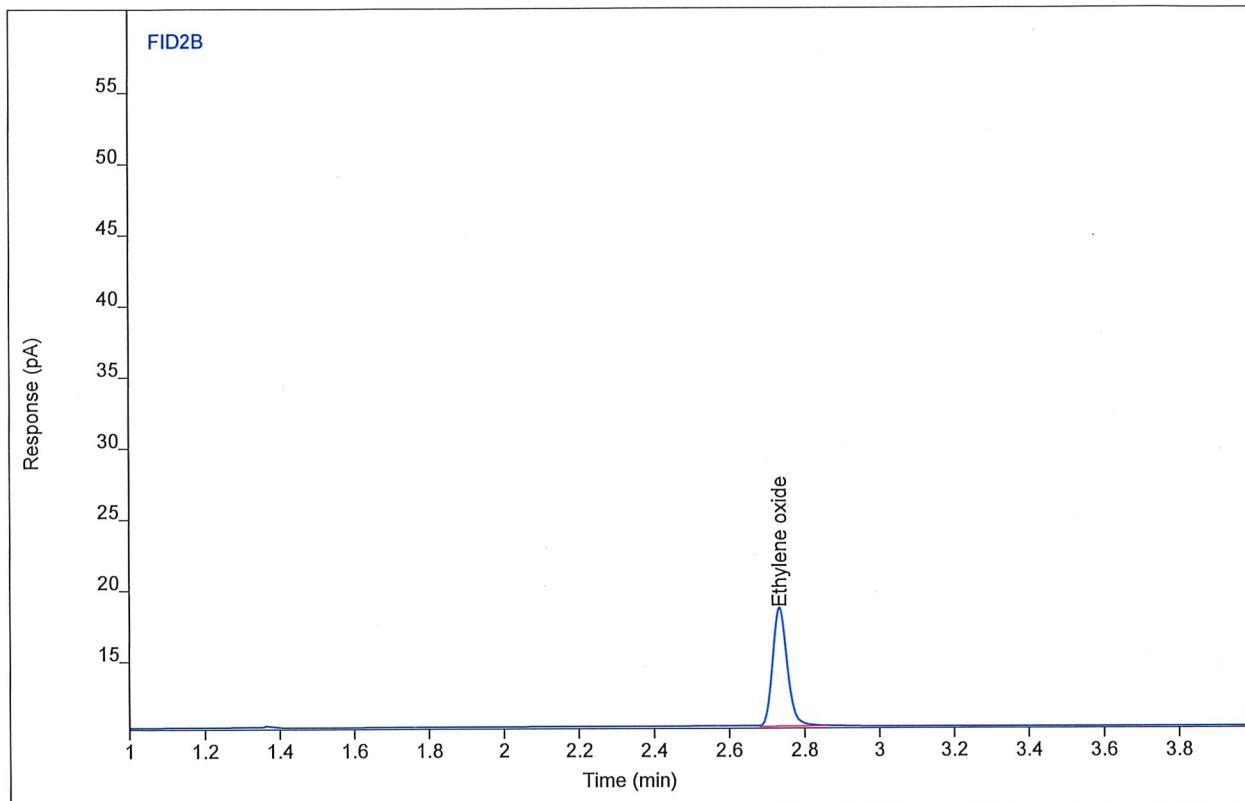
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 18.0085 | 6.72963 | 51.2720 | 21 | 1076.71 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 1-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 019B0901.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:13 PM  
File Modified 2/8/2019 7:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



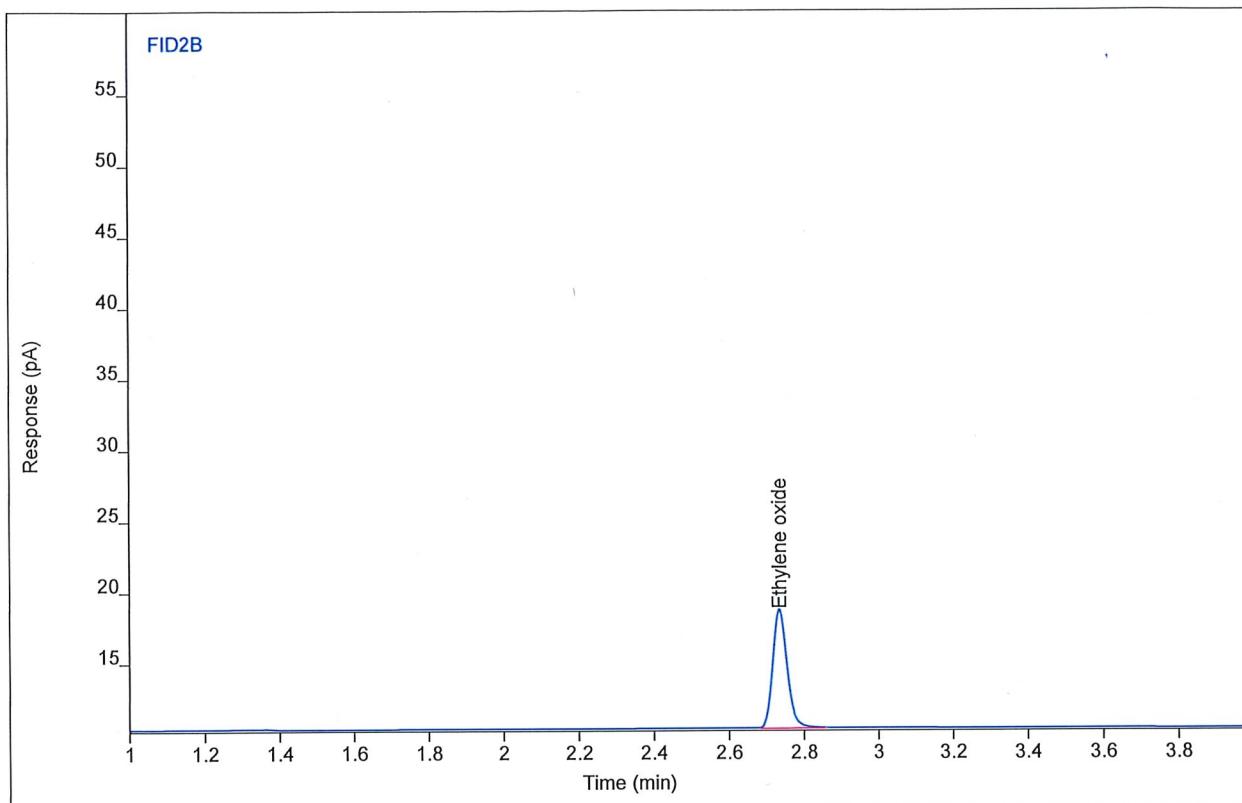
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 22.4004 | 8.34740 | 63.7673 | 21 | 1339.11 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 1-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 019B0902.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:21 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



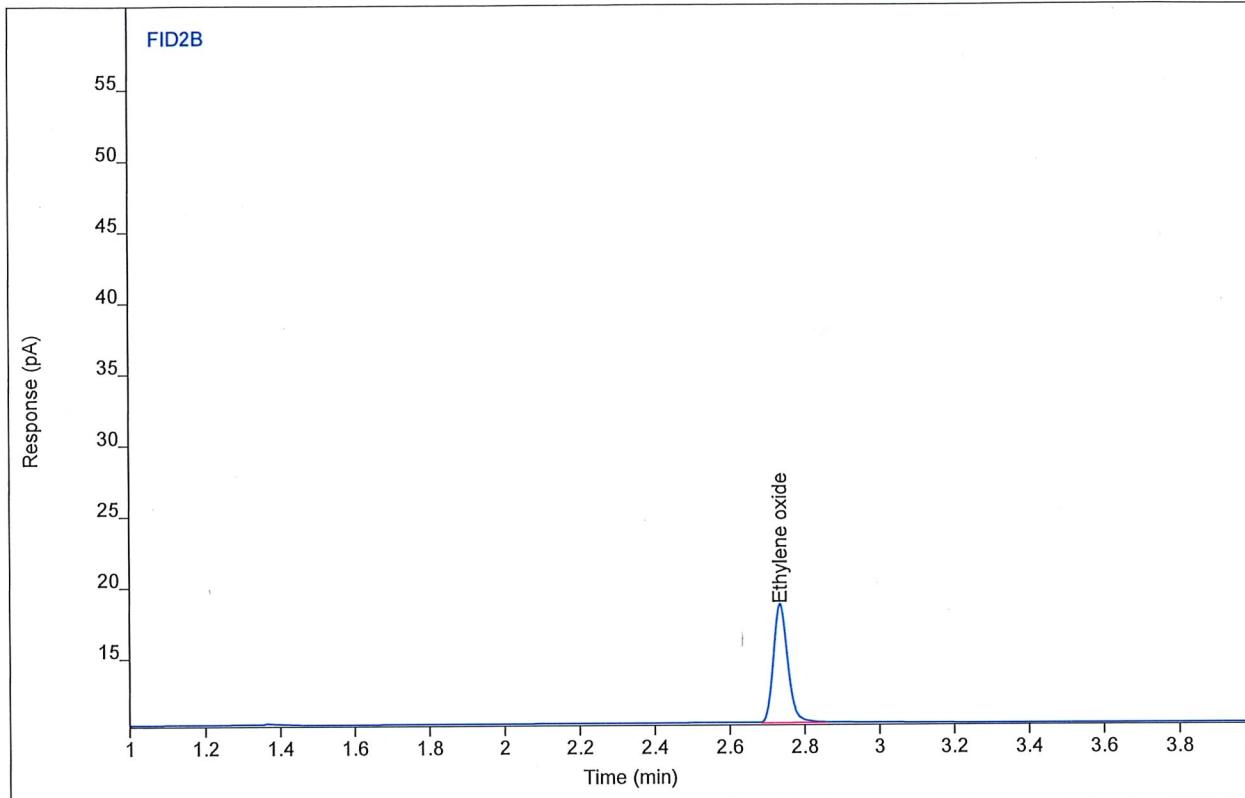
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 22.4392 | 8.37483 | 63.8778 | 21 | 1341.43 | ppm  |

## Chromatogram Report

Sample Name 0219-044.In 1-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 019B0903.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:28 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

## Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



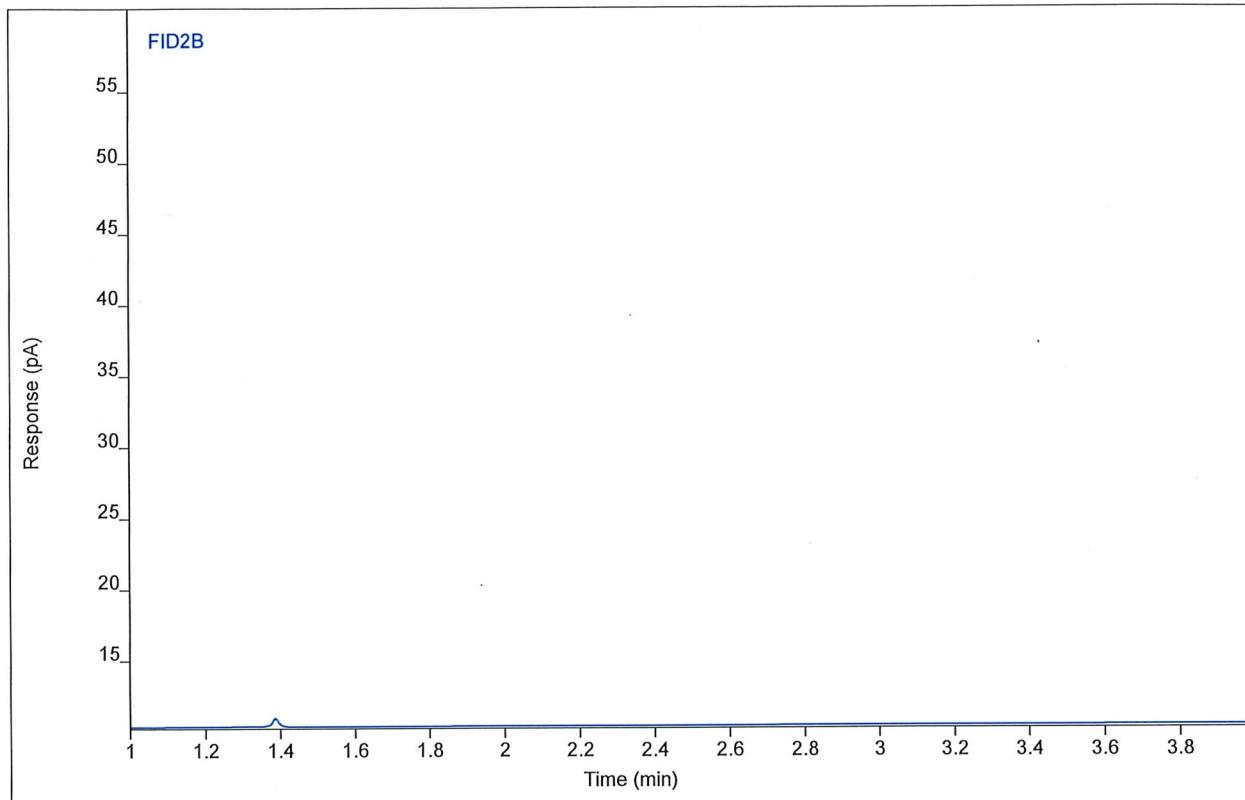
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 22.4640 | 8.36360 | 63.9483 | 21 | 1342.91 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 1-6.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 020B1001.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:36 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



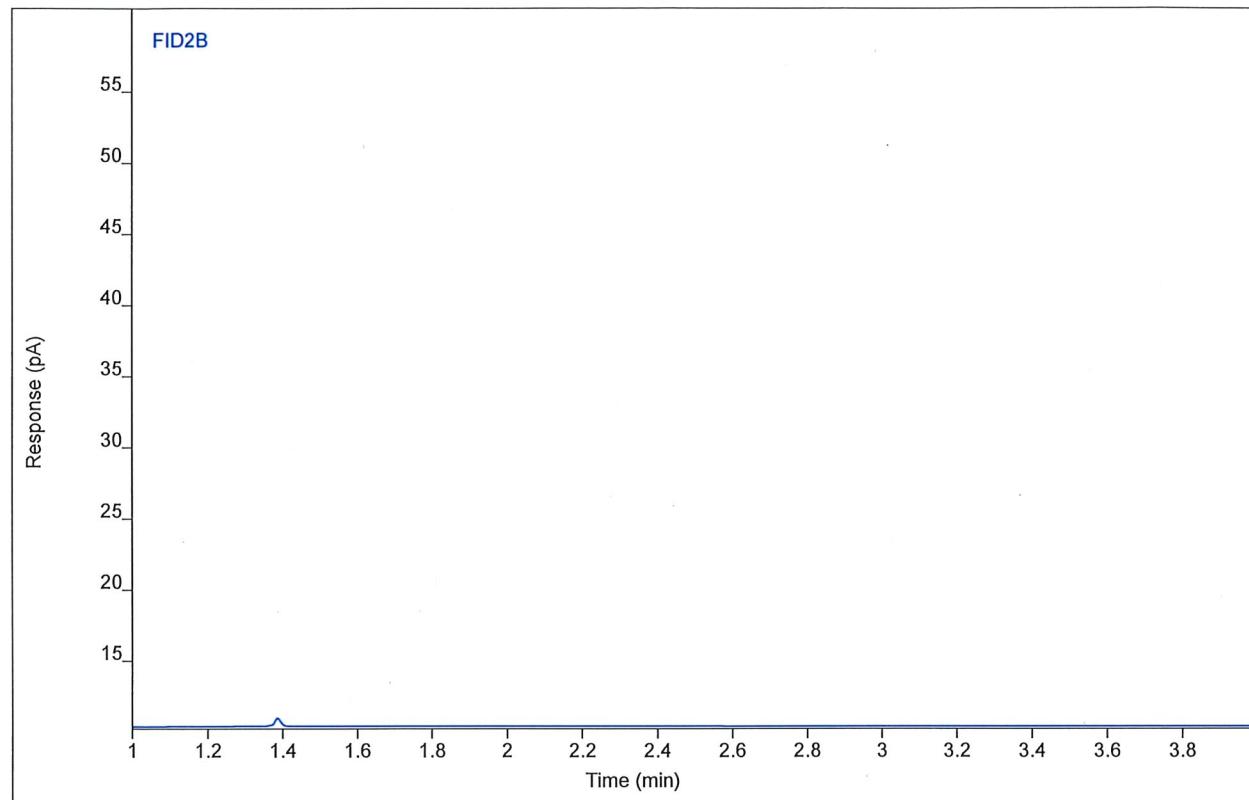
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        |    | 1       |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 020B1002.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:44 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



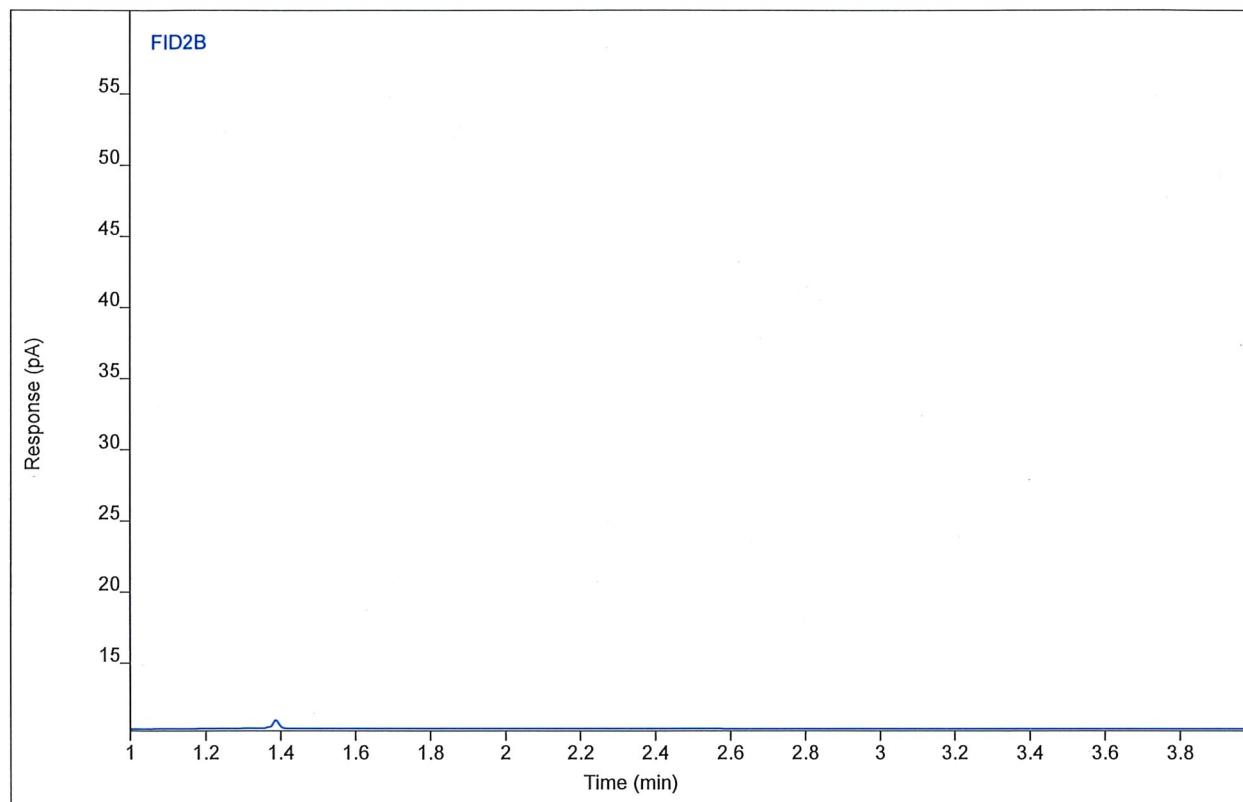
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 020B1003.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 5:51 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



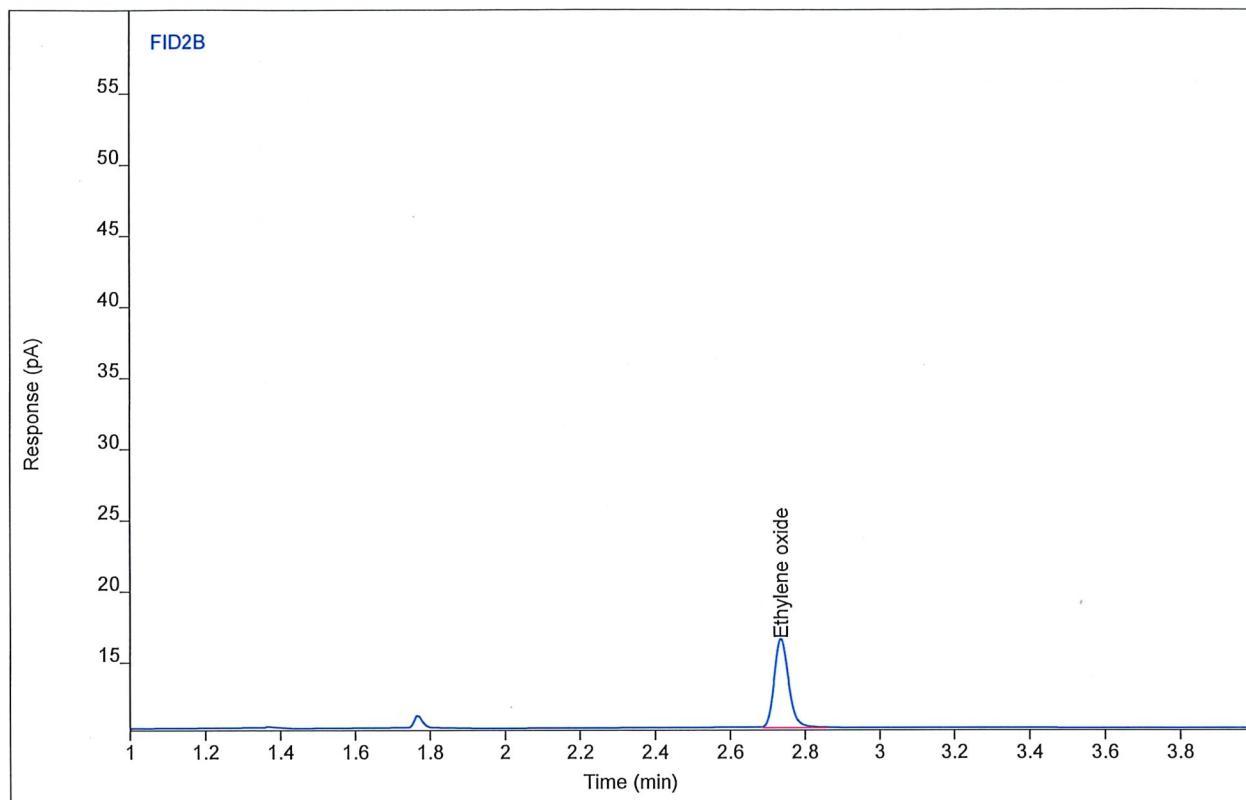
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 2-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 023B1201.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 6:22 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 23  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



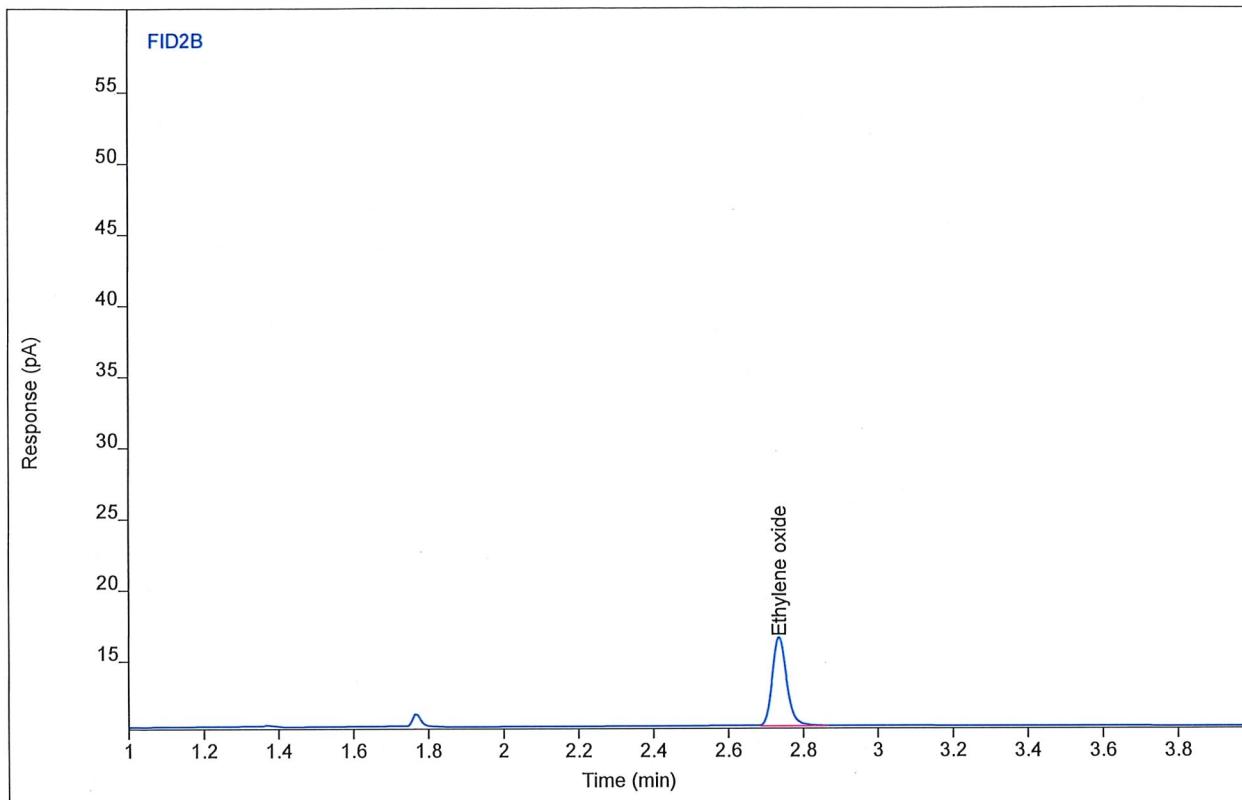
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 16.8295 | 6.25504 | 47.9177 | 21 | 1006.27 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 2-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 023B1202.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 6:29 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 23  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



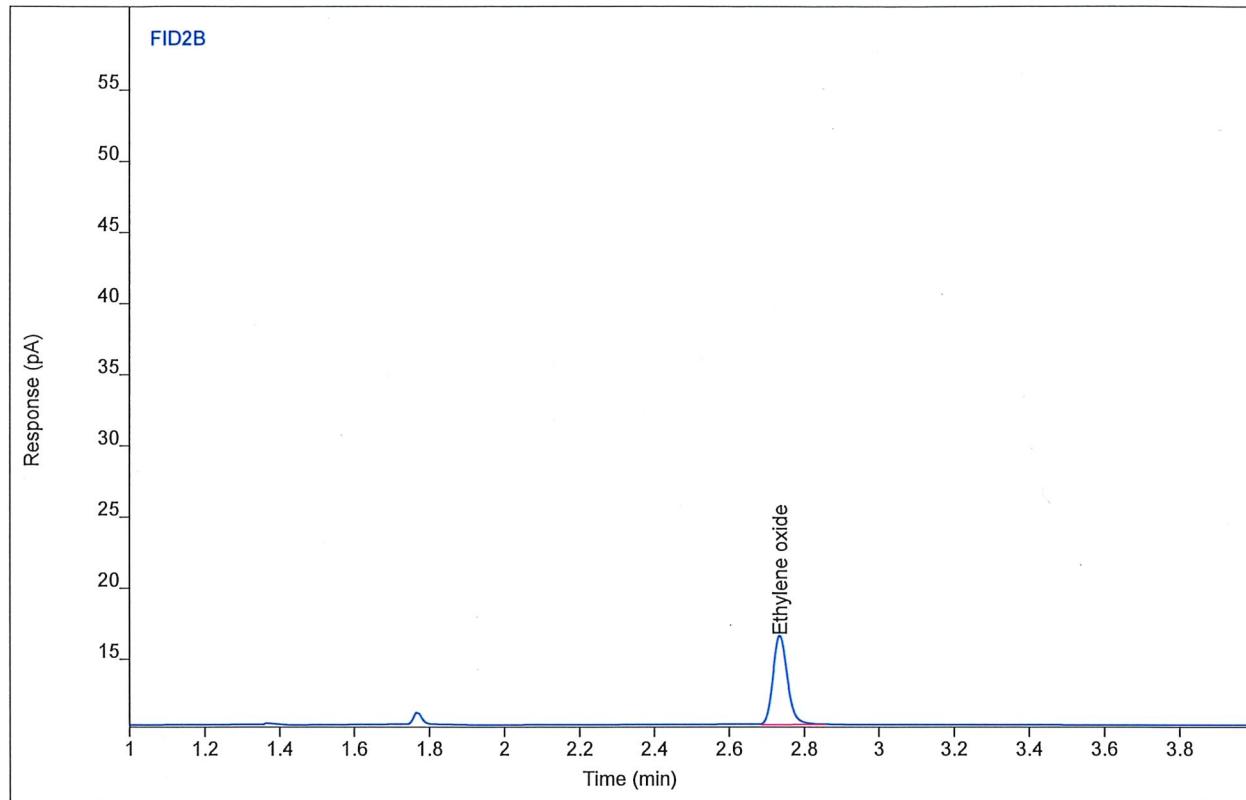
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 16.8474 | 6.26069 | 47.9685 | 21 | 1007.34 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 2-3.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 023B1203.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 6:37 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 23  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



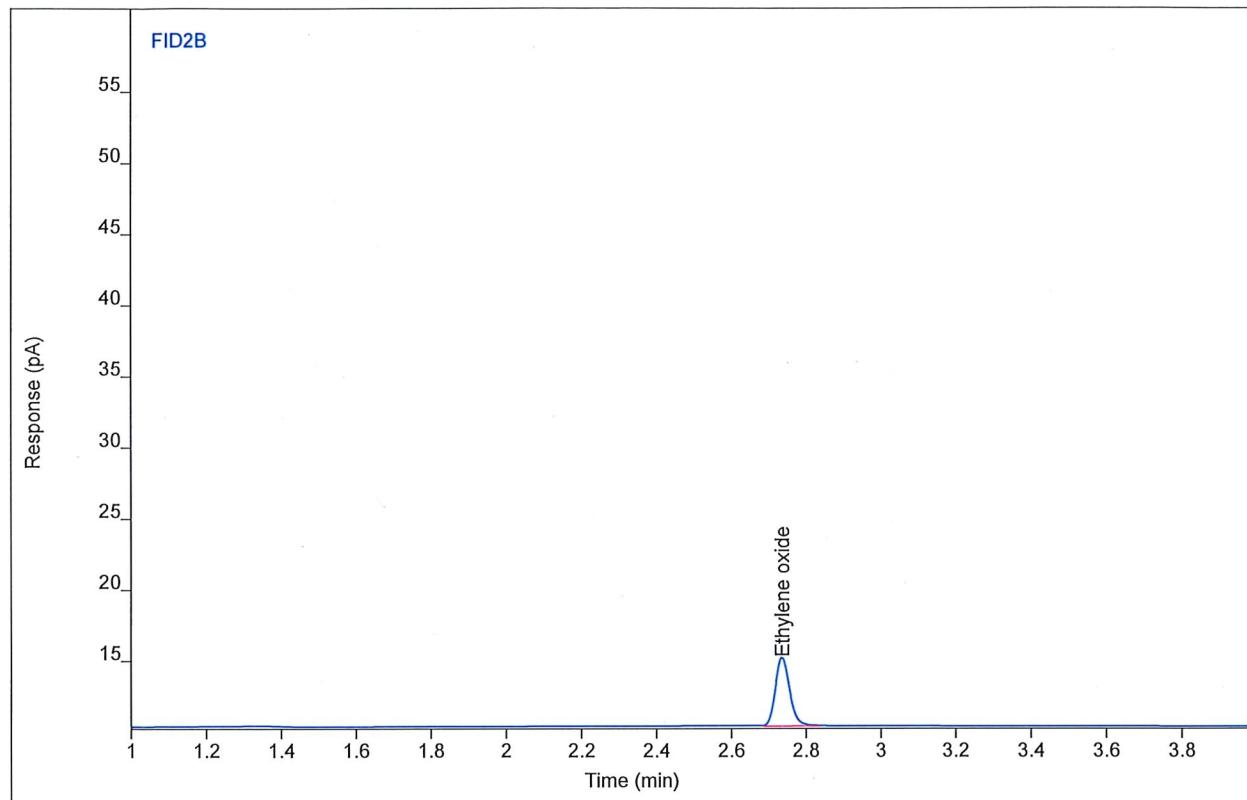
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 16.8443 | 6.27001 | 47.9598 | 21 | 1007.16 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 2-5.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 030B1301.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 6:45 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 30  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



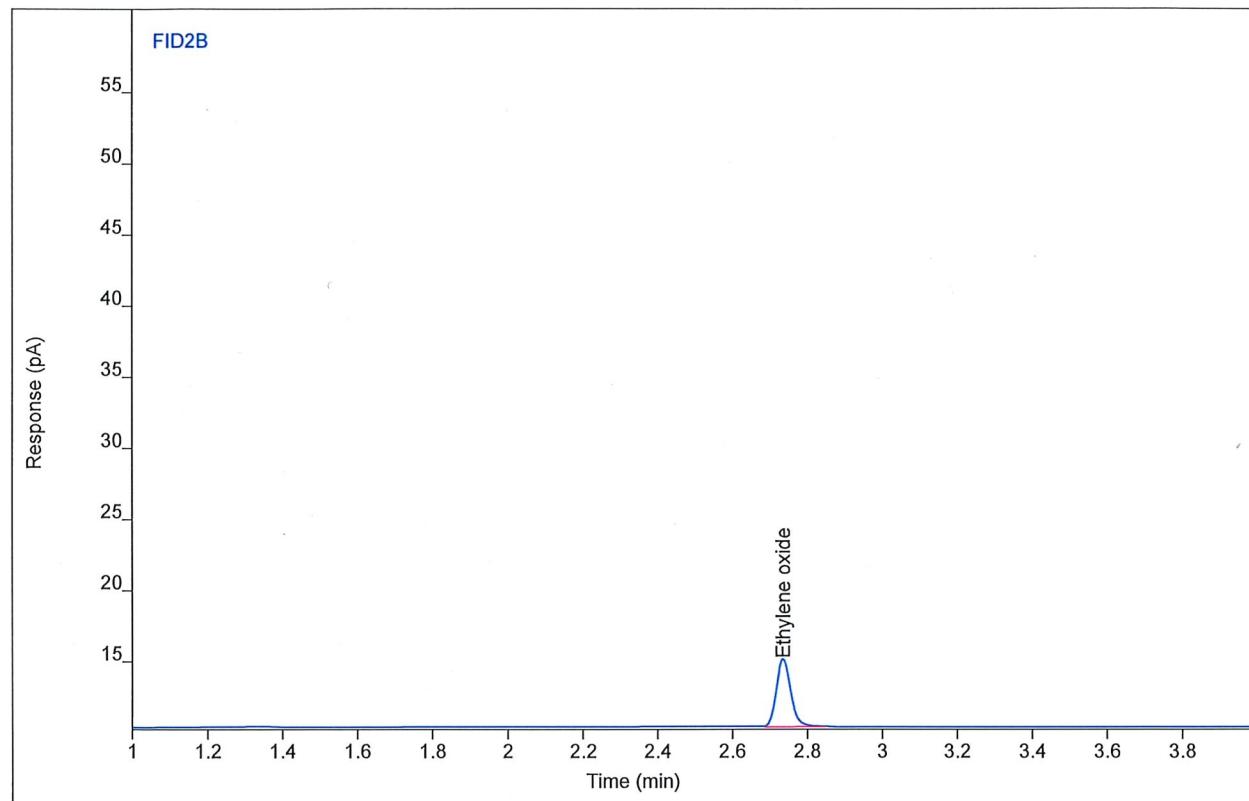
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 12.9219 | 4.84625 | 36.8004 | 21 | 772.809 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 2-5.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 030B1302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 6:52 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 30  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



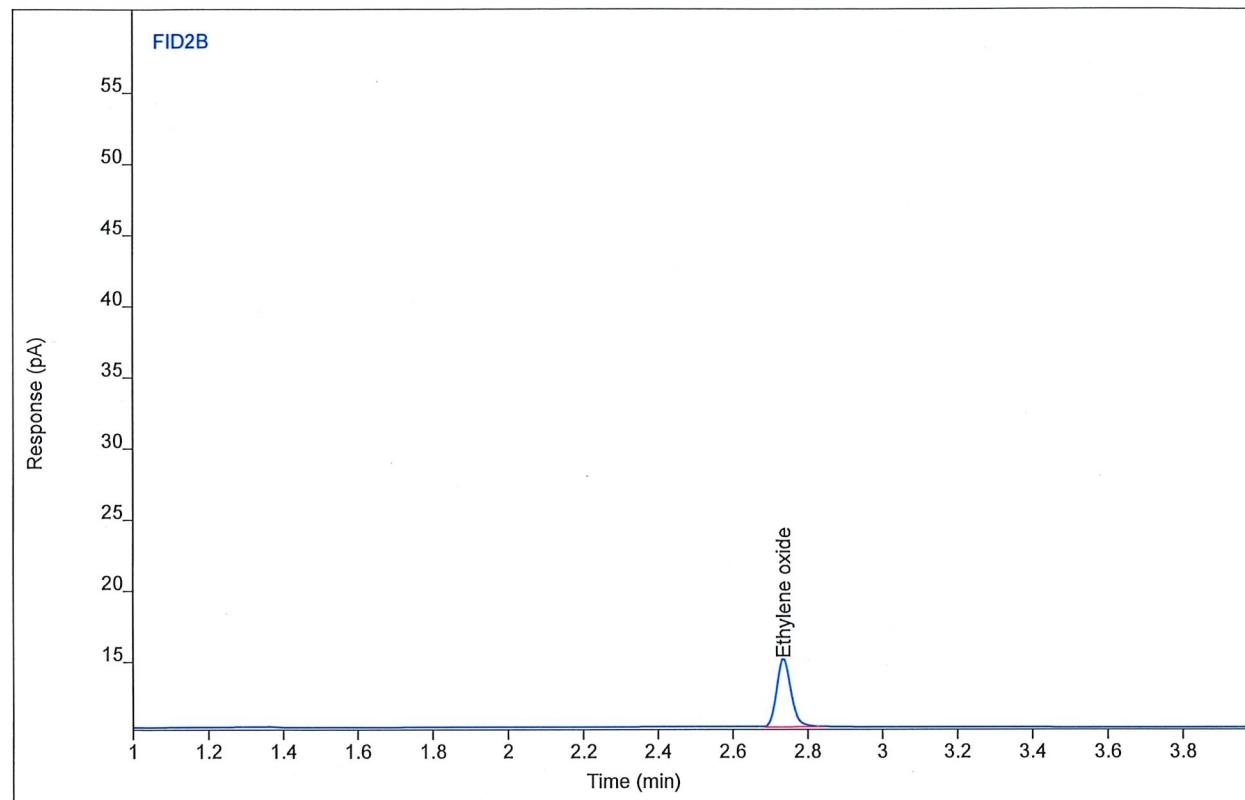
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 12.8442 | 4.78870 | 36.5792 | 21 | 768.163 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 2-5.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 030B1303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:00 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 30  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



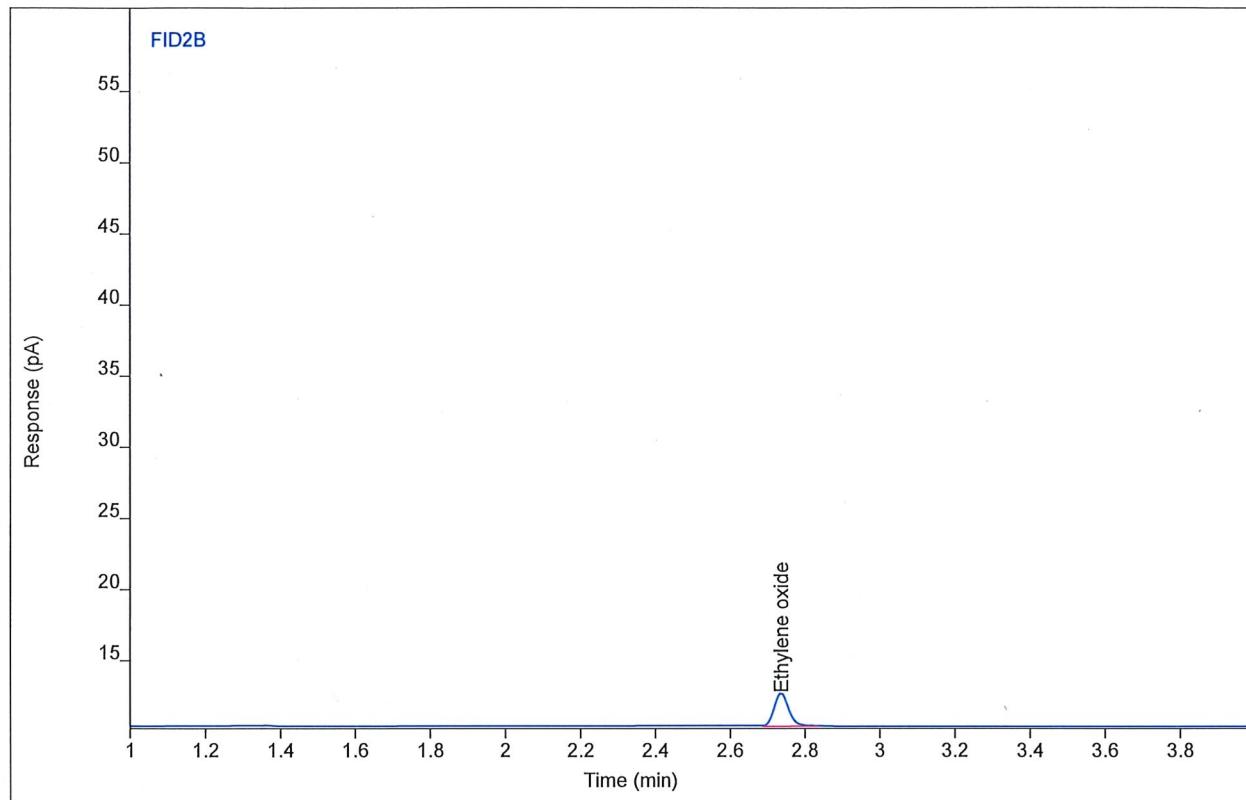
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 12.9189 | 4.81975 | 36.7919 | 21 | 772.630 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 1-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 021B1401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:07 PM  
File Modified 2/15/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number 21  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/15/2019 9:18 AM



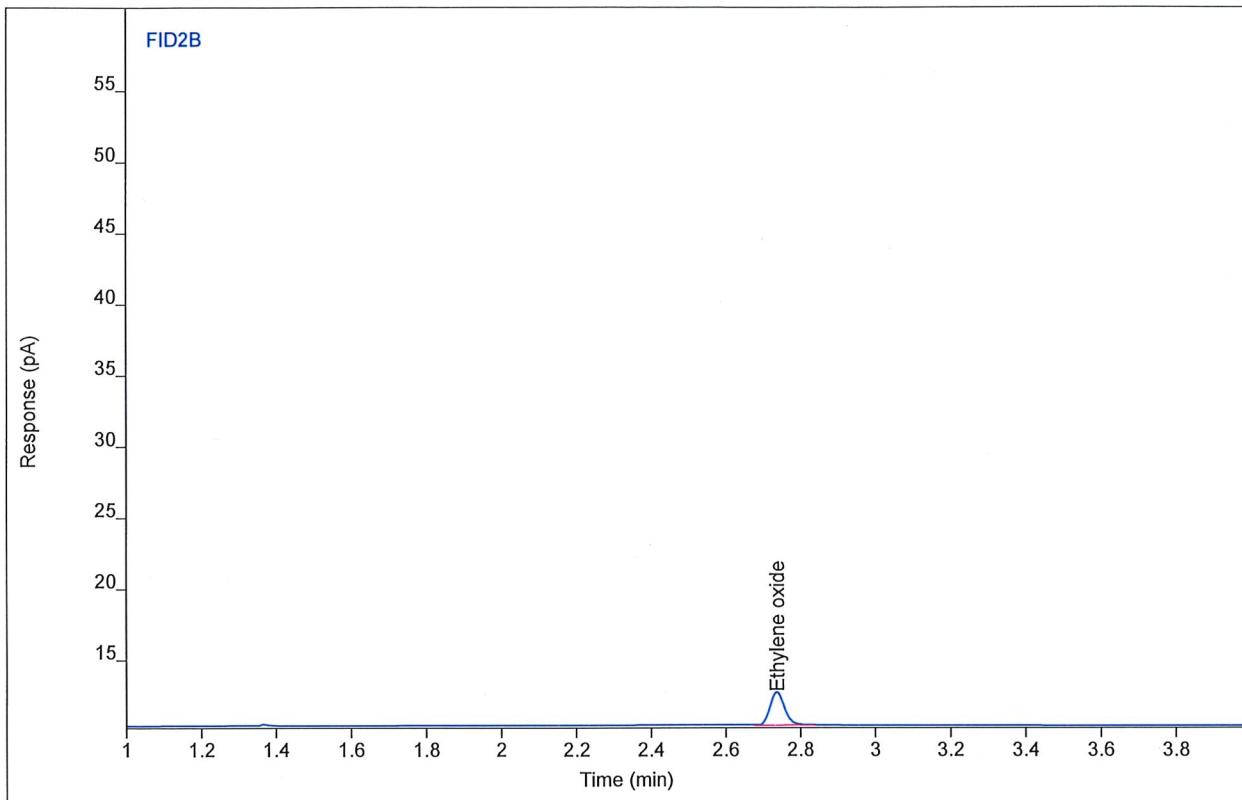
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 6.32490 | 2.34262 | 18.0314 | 31 | 558.974 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 1-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 021B1402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:15 PM  
File Modified 2/15/2019 8:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number 21  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/15/2019 9:18 AM



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.74 | 6.28131 | 2.35752 | 17.9074 | 31 | 555.130 | ppm  |

## Analyst Peak Integration Comments

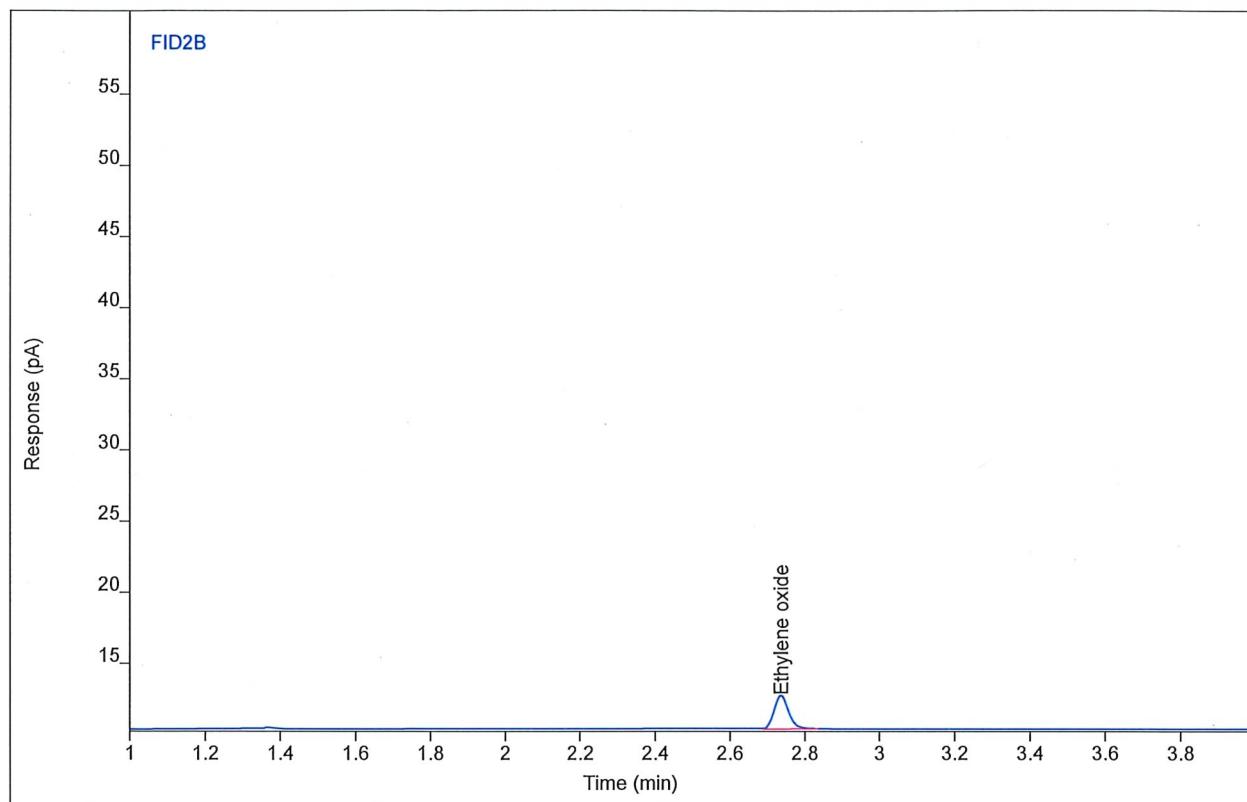
08:56:46 02/15/19 Justin Guenzler II

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 1-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 021B1403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:23 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number 21  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



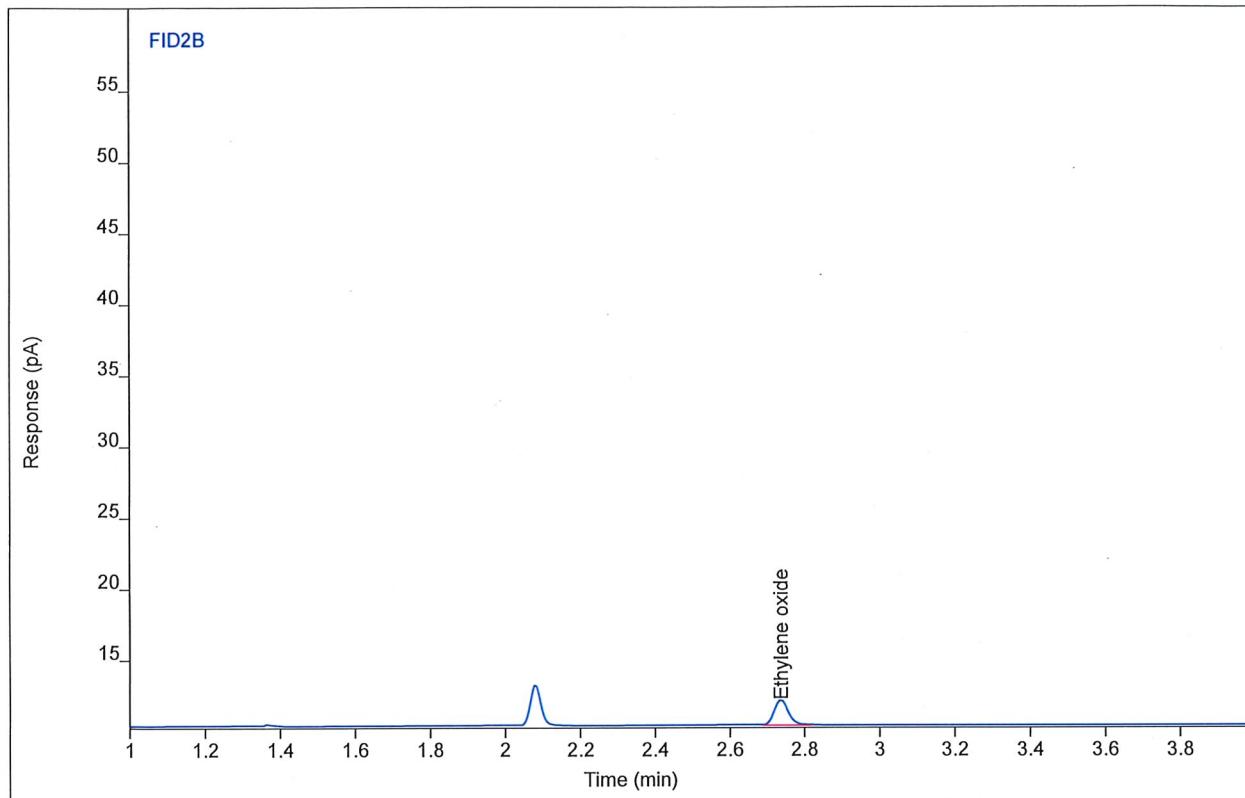
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 6.31446 | 2.35826 | 18.0017 | 31 | 558.053 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 2-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 028B1501.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:30 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 28  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



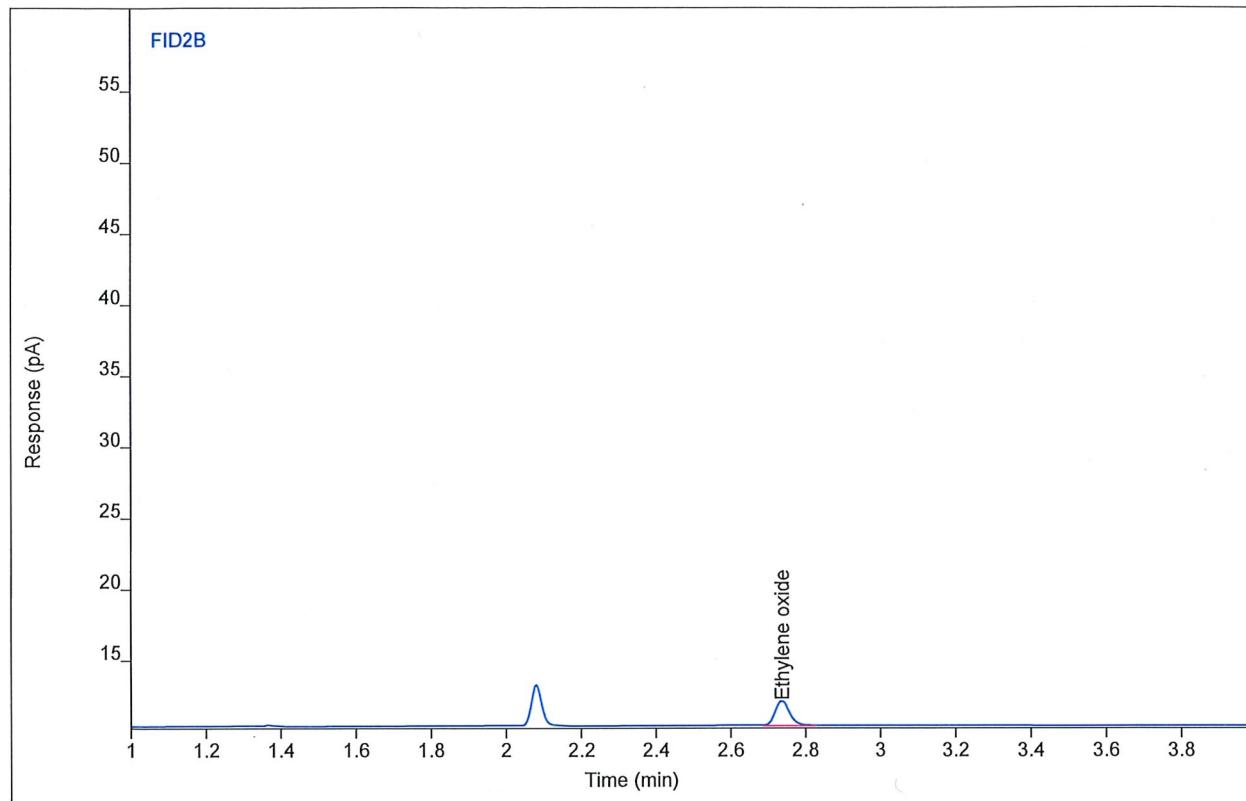
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 4.73610 | 1.75801 | 13.5112 | 31 | 418.847 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 2-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 028B1502.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:38 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 28  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



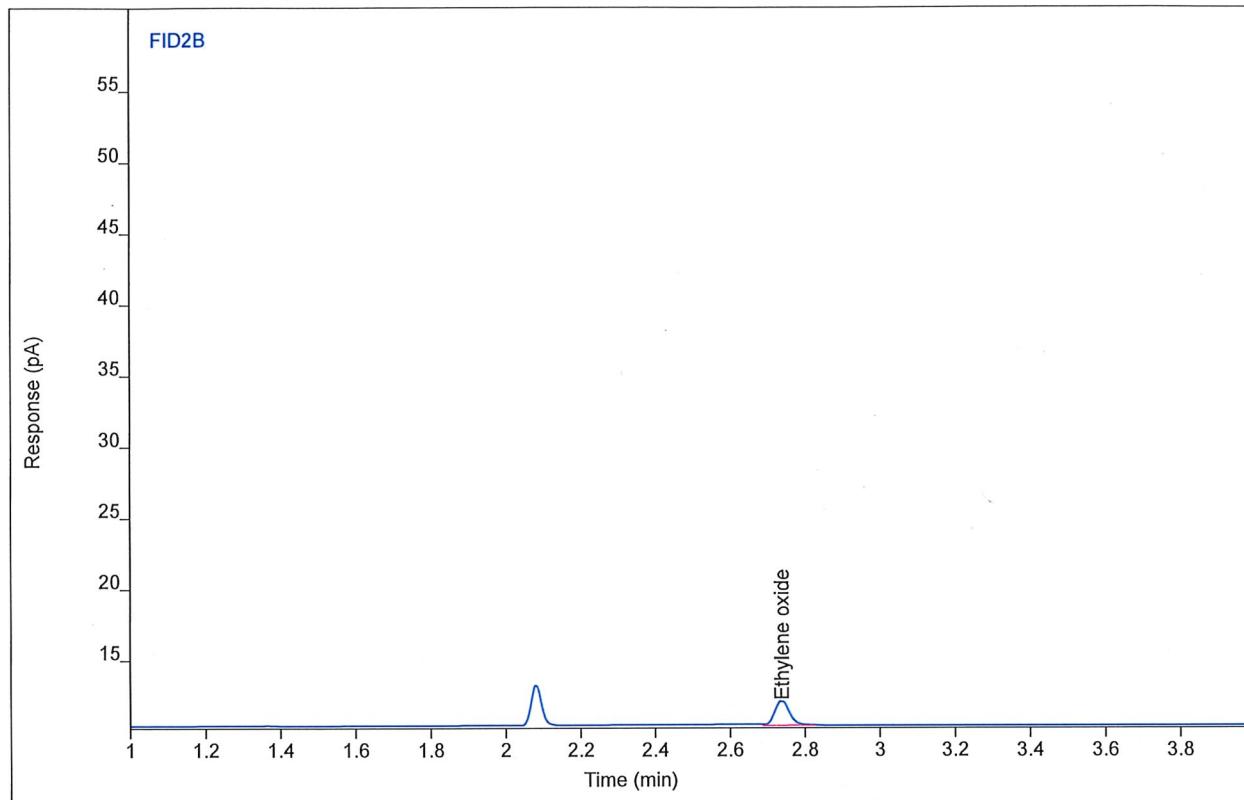
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 4.73516 | 1.76284 | 13.5085 | 31 | 418.763 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 2-1.Bag  
Sequence Name BETTYP1031 ver.2  
Inj Data File 028B1503.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:46 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 28  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



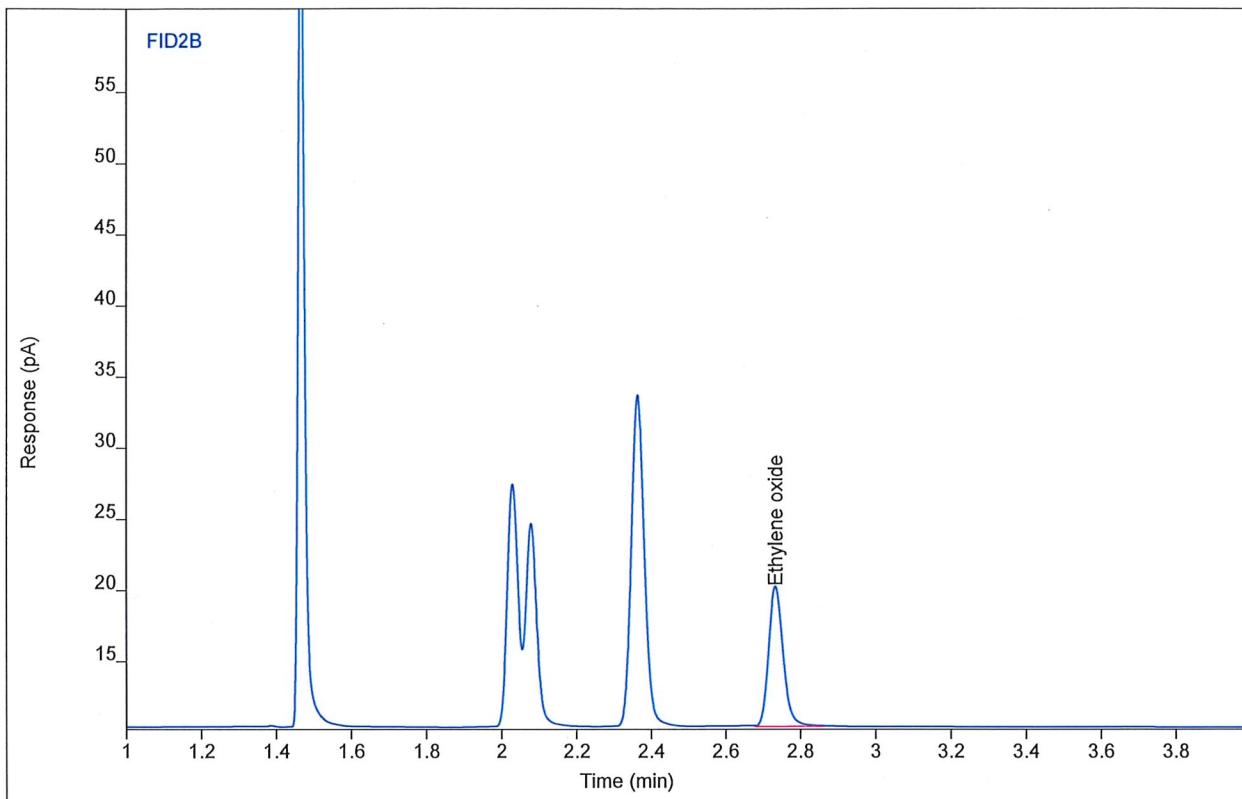
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 4.70974 | 1.76195 | 13.4362 | 31 | 416.521 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1031 ver.2  
Inj Data File 025B1601.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/7/2019 7:56 PM  
File Modified 2/8/2019 7:56 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM

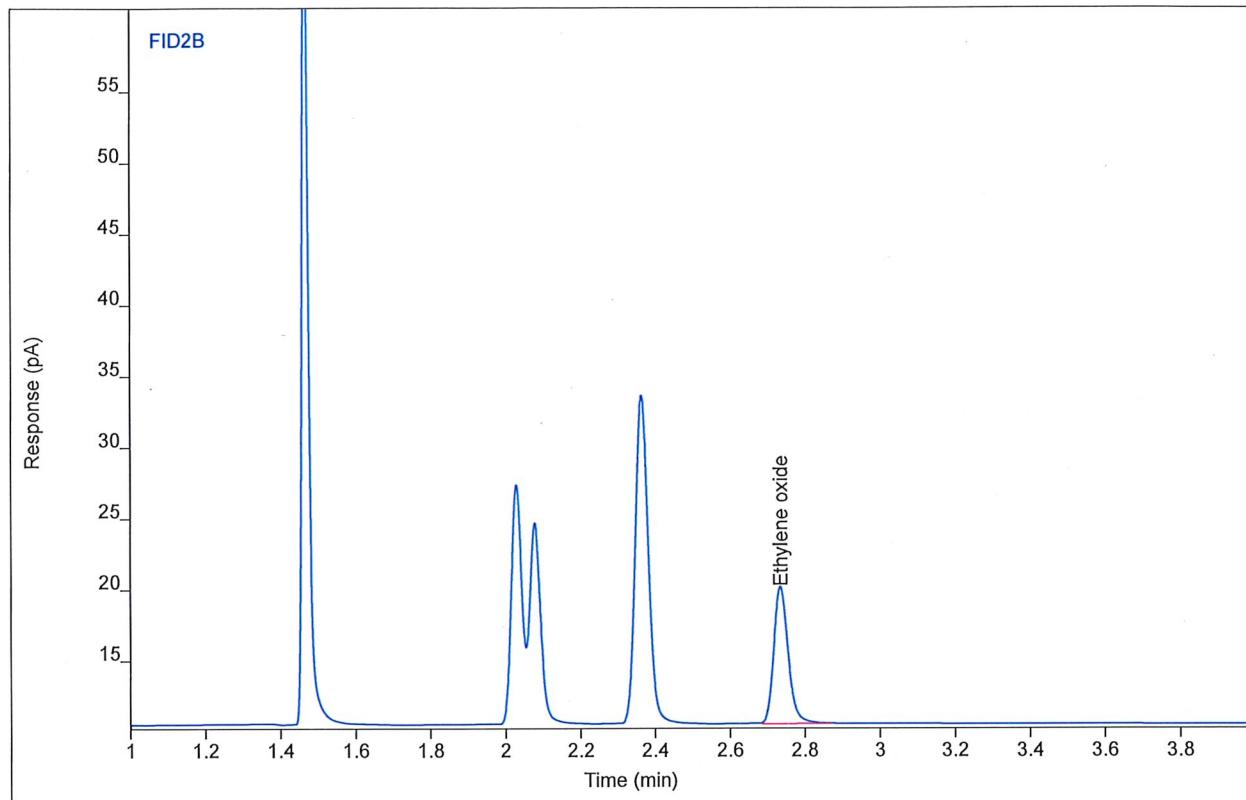


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 26.5069 | 9.85584 | 75.4505 | 1  | 75.4505 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                     |
|----------------|----------------------------------|--------------------|---------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration         |
| Sequence Name  | BETTYP1031 ver.2                 | Vial Number        | Vial 25             |
| Inj Data File  | 025B1602.D                       | Injection Volume   | 250                 |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 2 of 3              |
| Injection Date | 2/7/2019 8:21 PM                 | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 2/8/2019 7:56 AM                 | Analysis Method    | BETTYP957_EO.M      |
| Instrument     | Betty                            | Method Modified    | 11/21/2018 12:33 PM |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:18 AM   |

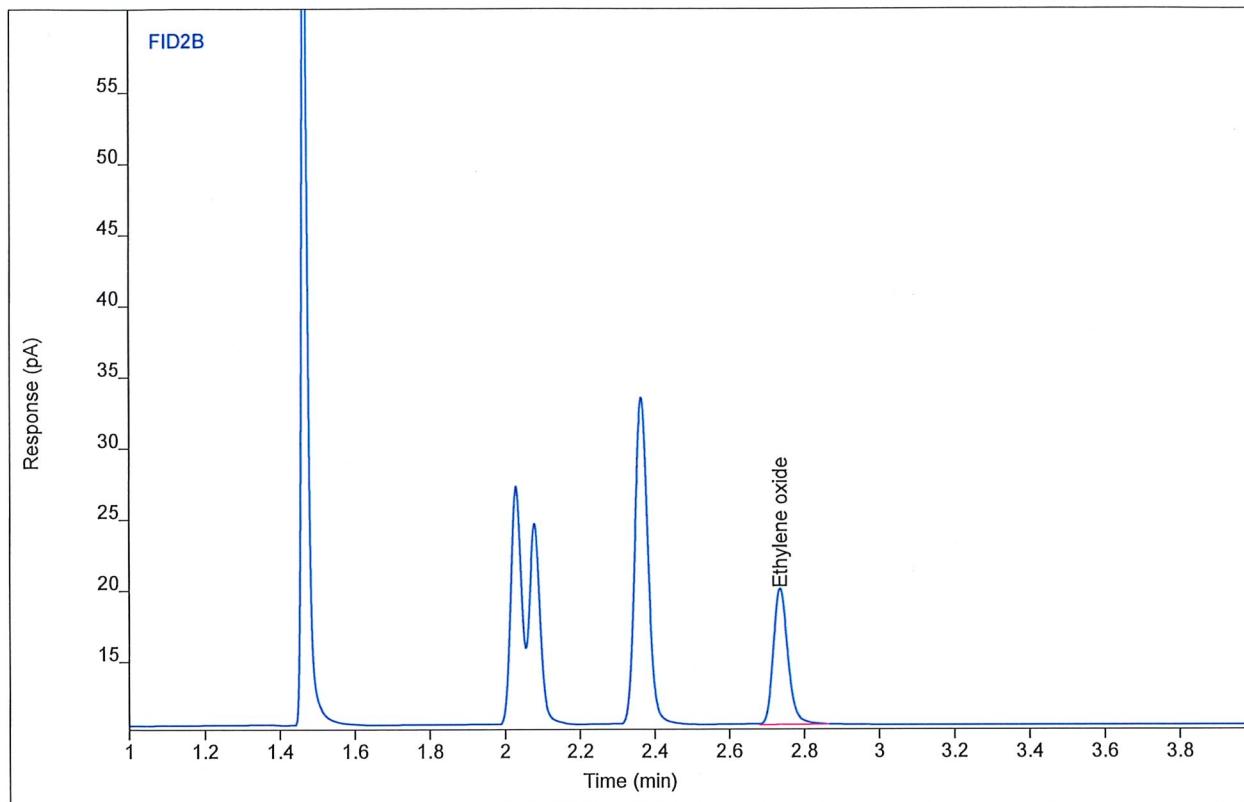


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 26.0030 | 9.64949 | 74.0169 | 1  | 74.0169 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                     |
|----------------|----------------------------------|--------------------|---------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration         |
| Sequence Name  | BETTYP1031 ver.2                 | Vial Number        | Vial 25             |
| Inj Data File  | 025B1603.D                       | Injection Volume   | 250                 |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 3 of 3              |
| Injection Date | 2/7/2019 8:45 PM                 | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 2/8/2019 7:56 AM                 | Analysis Method    | BETTYP957_EO.M      |
| Instrument     | Betty                            | Method Modified    | 11/21/2018 12:33 PM |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:18 AM   |

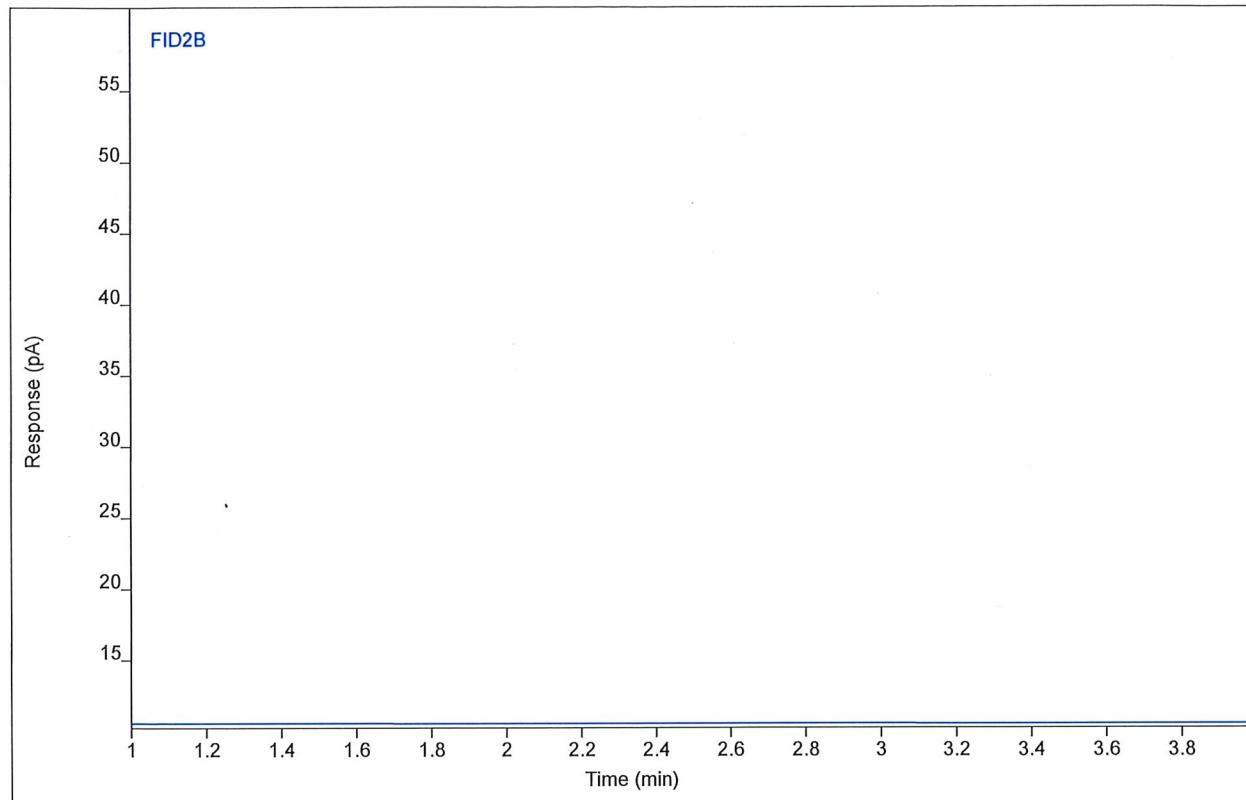


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 25.8212 | 9.58326 | 73.4998 | 1  | 73.4998 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                              |                    |                     |
|----------------|------------------------------|--------------------|---------------------|
| Sample Name    | BettyP374 Method Blank 1 #MB | Sample Type        | Control             |
| Sequence Name  | BETTYP1031 ver.2             | Vial Number        | Vial 17             |
| Inj Data File  | 017B2001.D                   | Injection Volume   | 250                 |
| File Location  | GC/2019/Betty/Quarter 1      | Injection          | 1 of 3              |
| Injection Date | 2/8/2019 3:33 AM             | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 2/8/2019 7:57 AM             | Analysis Method    | BETTYP957_EO.M      |
| Instrument     | Betty                        | Method Modified    | 11/21/2018 12:33 PM |
| Operator       | Justin Guenzler              | Printed            | 2/15/2019 9:18 AM   |

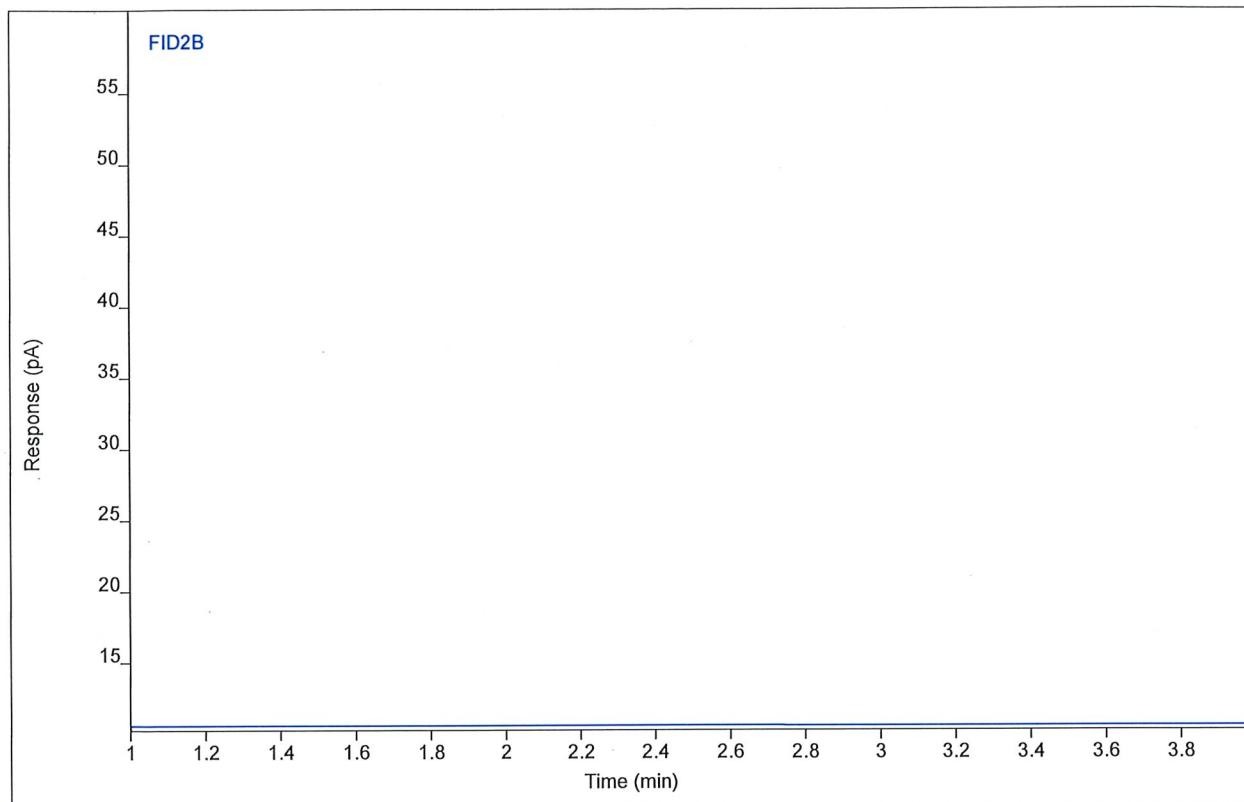


| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

|                |                              |                    |                     |
|----------------|------------------------------|--------------------|---------------------|
| Sample Name    | BettyP374 Method Blank 1 #MB | Sample Type        | Control             |
| Sequence Name  | BETTYP1031 ver.2             | Vial Number        | Vial 17             |
| Inj Data File  | 017B2002.D                   | Injection Volume   | 250                 |
| File Location  | GC/2019/Betty/Quarter 1      | Injection          | 2 of 3              |
| Injection Date | 2/8/2019 3:55 AM             | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 2/8/2019 7:57 AM             | Analysis Method    | BETTYP957_EO.M      |
| Instrument     | Betty                        | Method Modified    | 11/21/2018 12:33 PM |
| Operator       | Justin Guenzler              | Printed            | 2/15/2019 9:18 AM   |



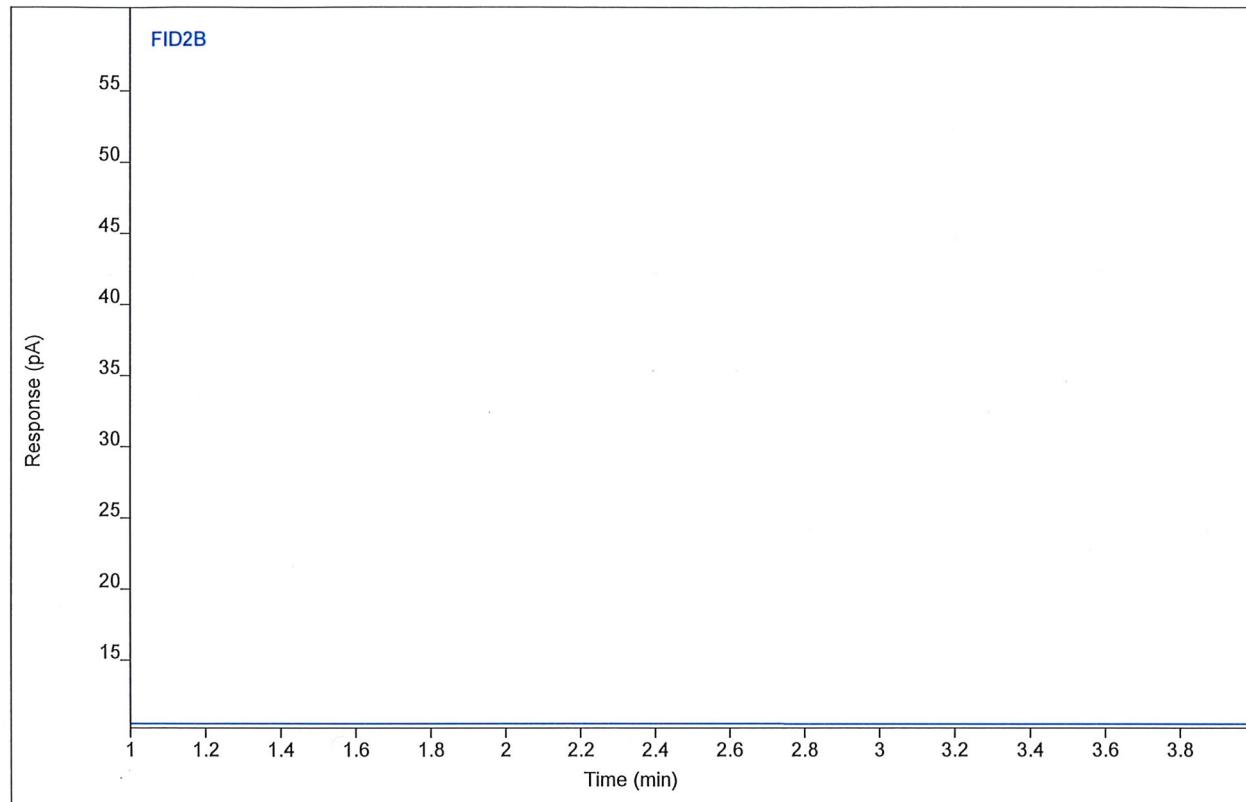
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        |    | 1       |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP374 Method Blank 1 #MB  
Sequence Name BETTYP1031 ver.2  
Inj Data File 017B2003.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 4:17 AM  
File Modified 2/8/2019 7:57 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Control  
Vial Number Vial 17  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



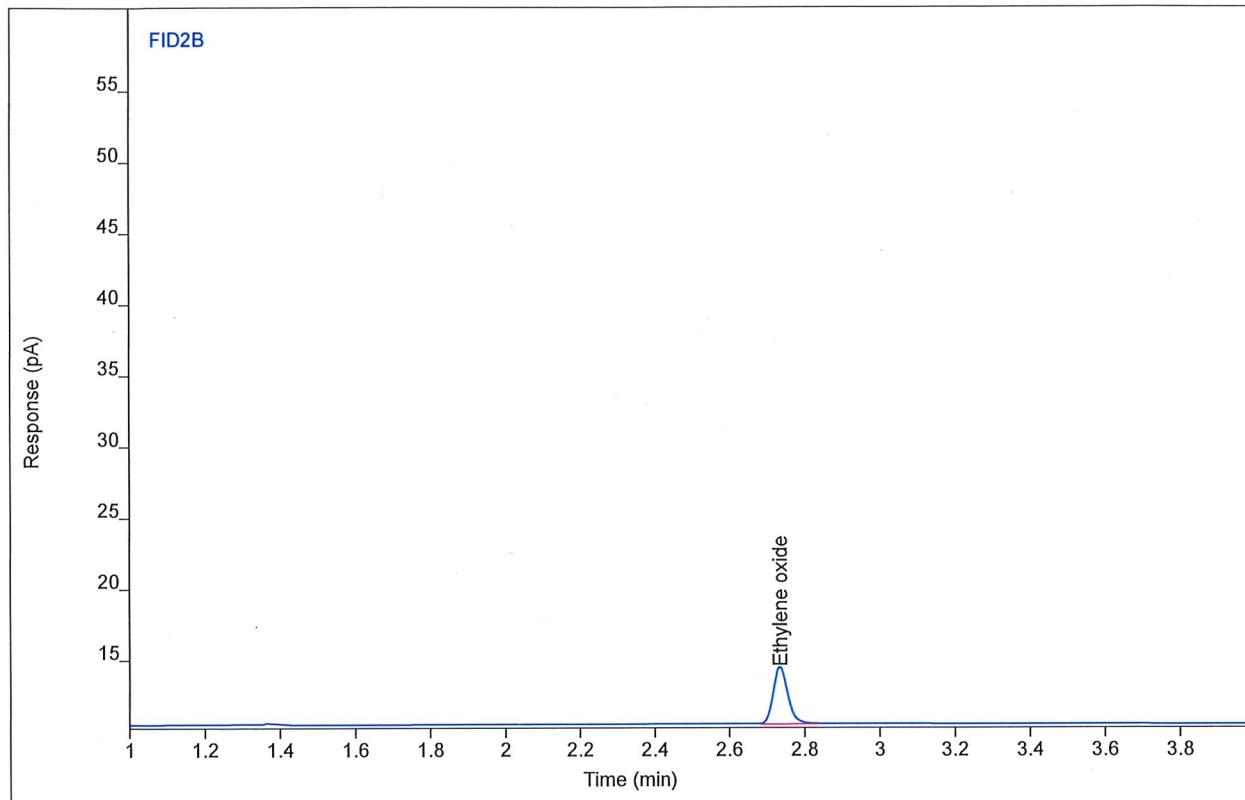
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 1-5.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 026B0101.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 8:46 AM  
File Modified 2/12/2019 7:30 AM  
Instrument  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 26  
Injection Volume 250  
Injection 1 of 1  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



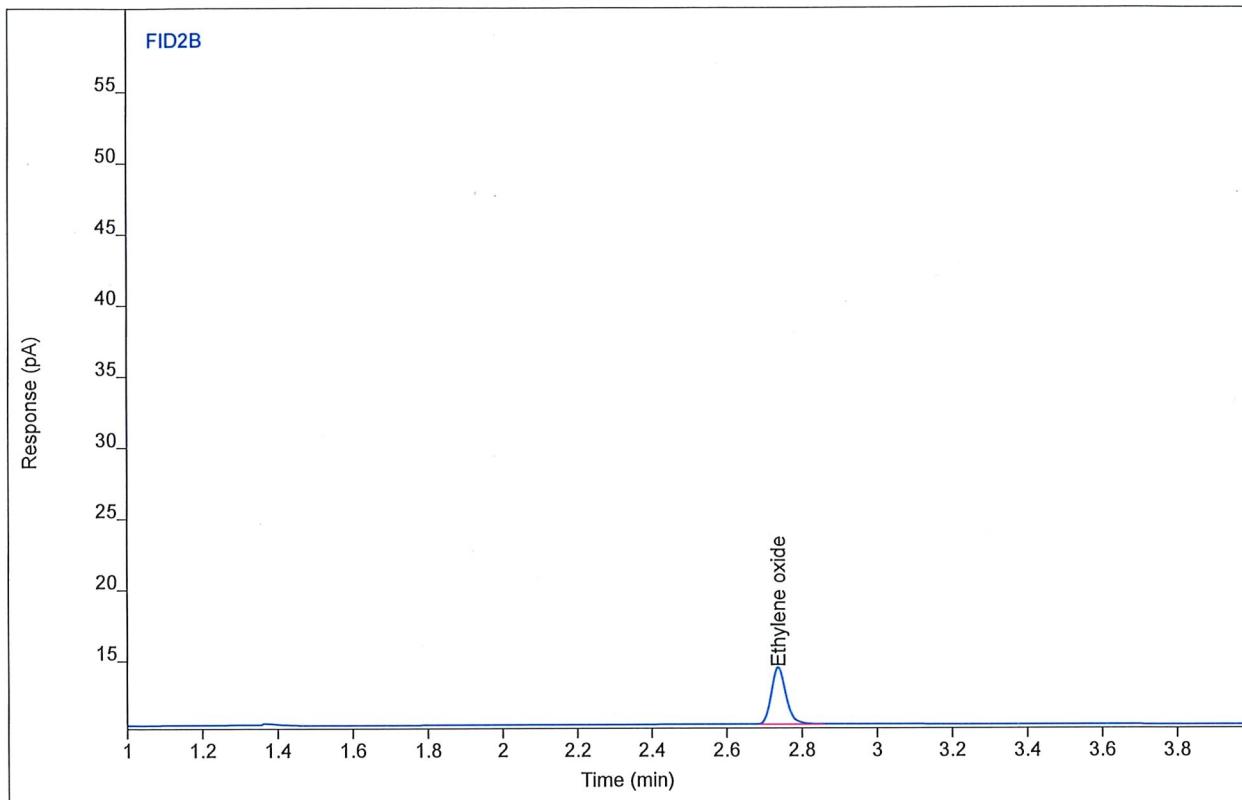
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 10.8106 | 4.01448 | 30.7936 | 31 | 954.601 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 1-5.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 026B0201.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 8:56 AM  
File Modified 2/12/2019 7:30 AM  
Instrument  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 26  
Injection Volume 250  
Injection 1 of 2  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



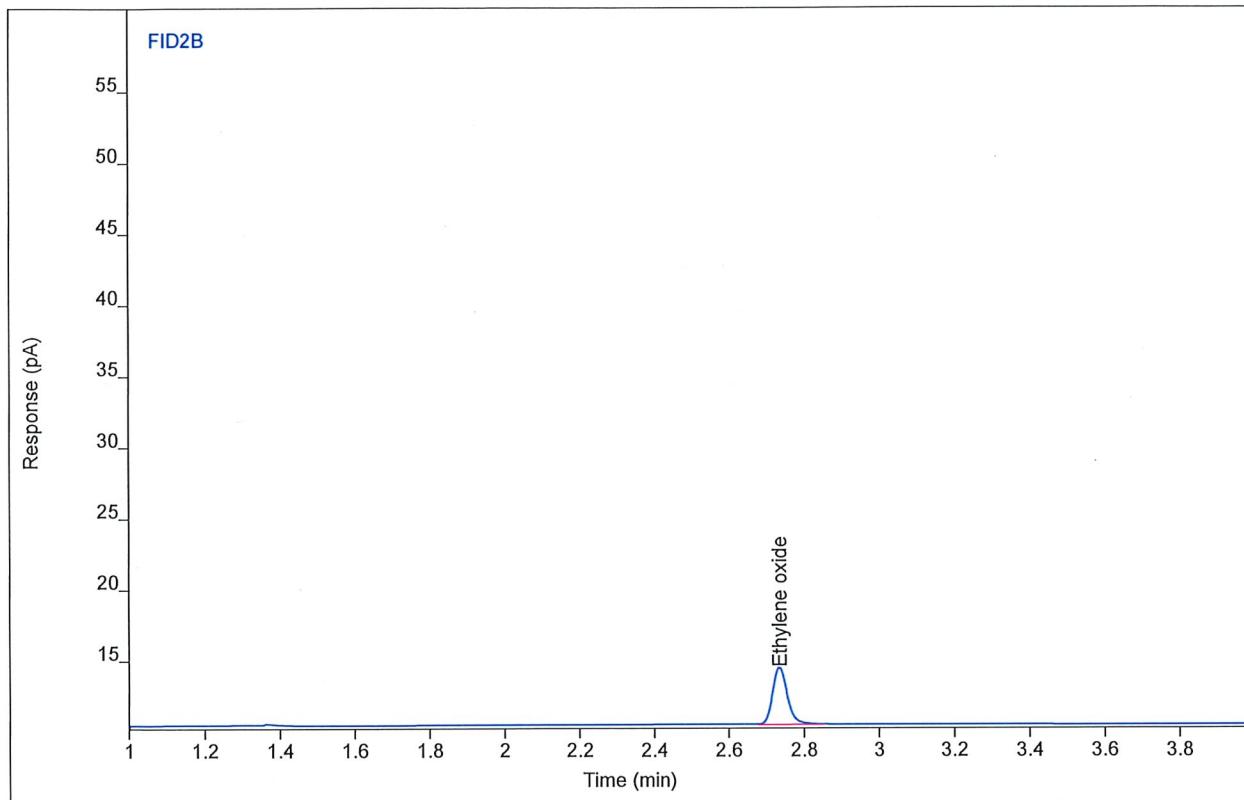
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 10.9017 | 4.03018 | 31.0528 | 31 | 962.638 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 1-5.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 026B0202.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 9:03 AM  
File Modified 2/12/2019 7:30 AM  
Instrument  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 26  
Injection Volume 250  
Injection 2 of 2  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



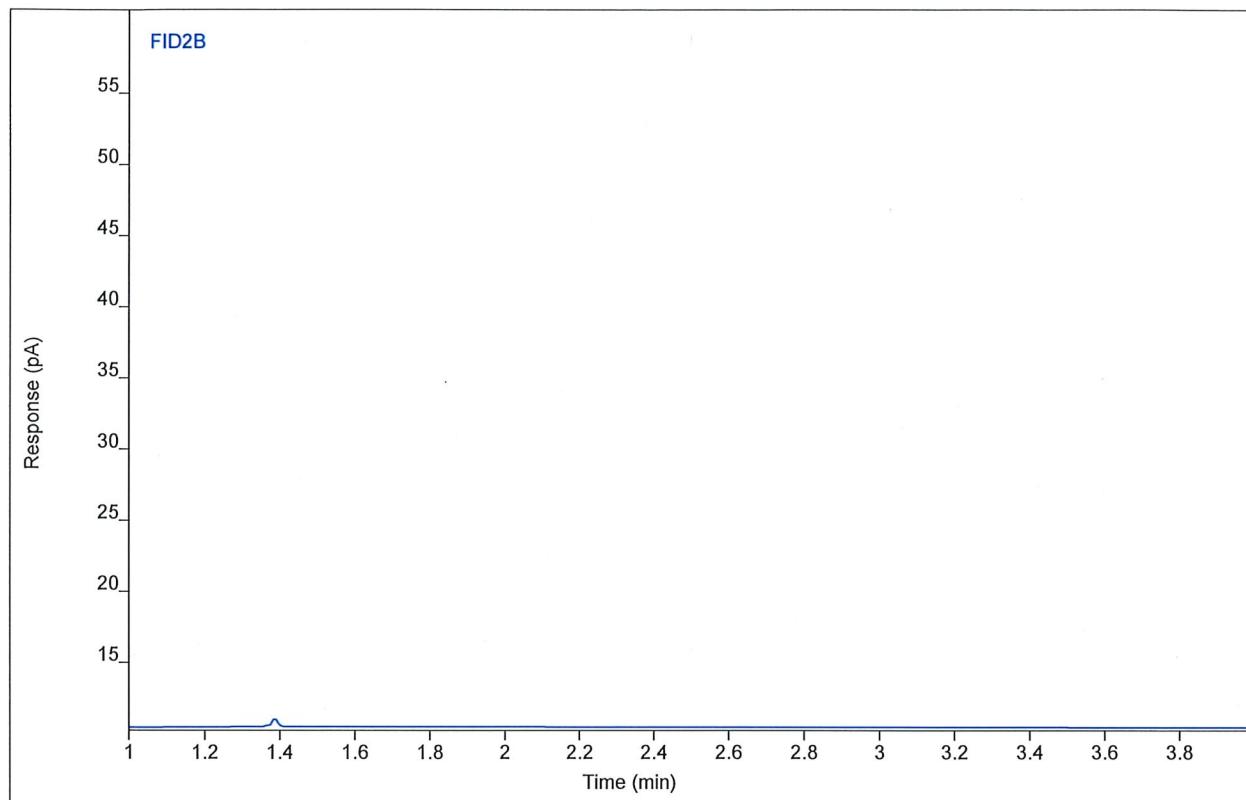
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 10.9180 | 4.01828 | 31.0991 | 31 | 964.073 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-4.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 019B1301.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 12:36 PM  
File Modified 2/12/2019 7:30 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 1  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



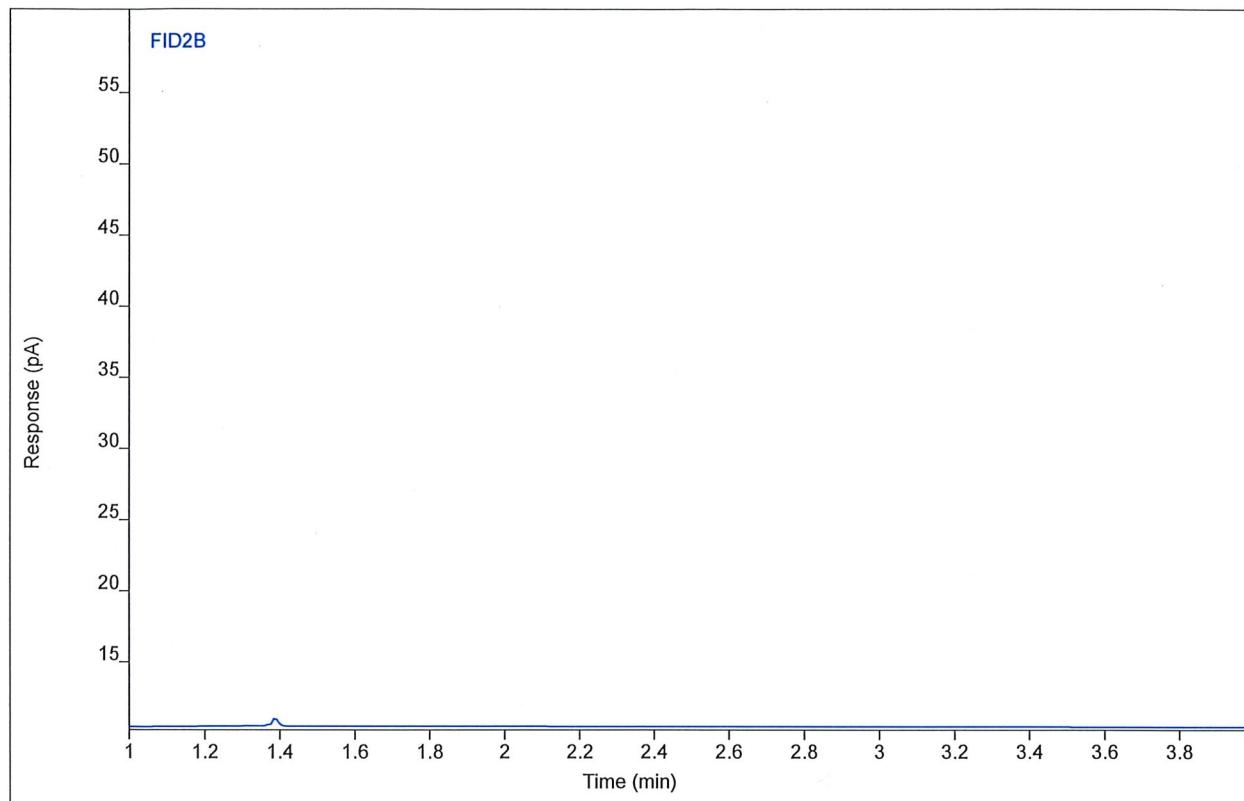
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-4.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 019B1401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 12:45 PM  
File Modified 2/12/2019 7:30 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 2  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



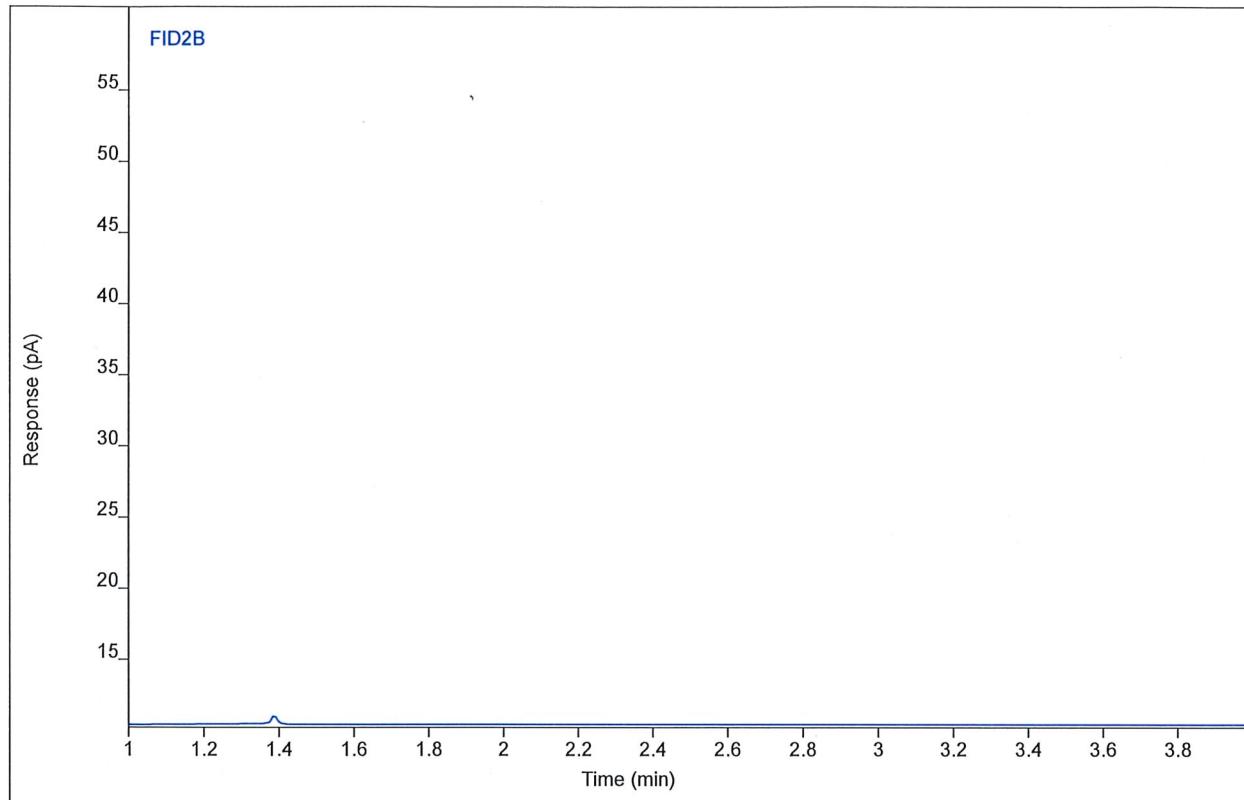
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-4.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 019B1402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 12:53 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 2  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



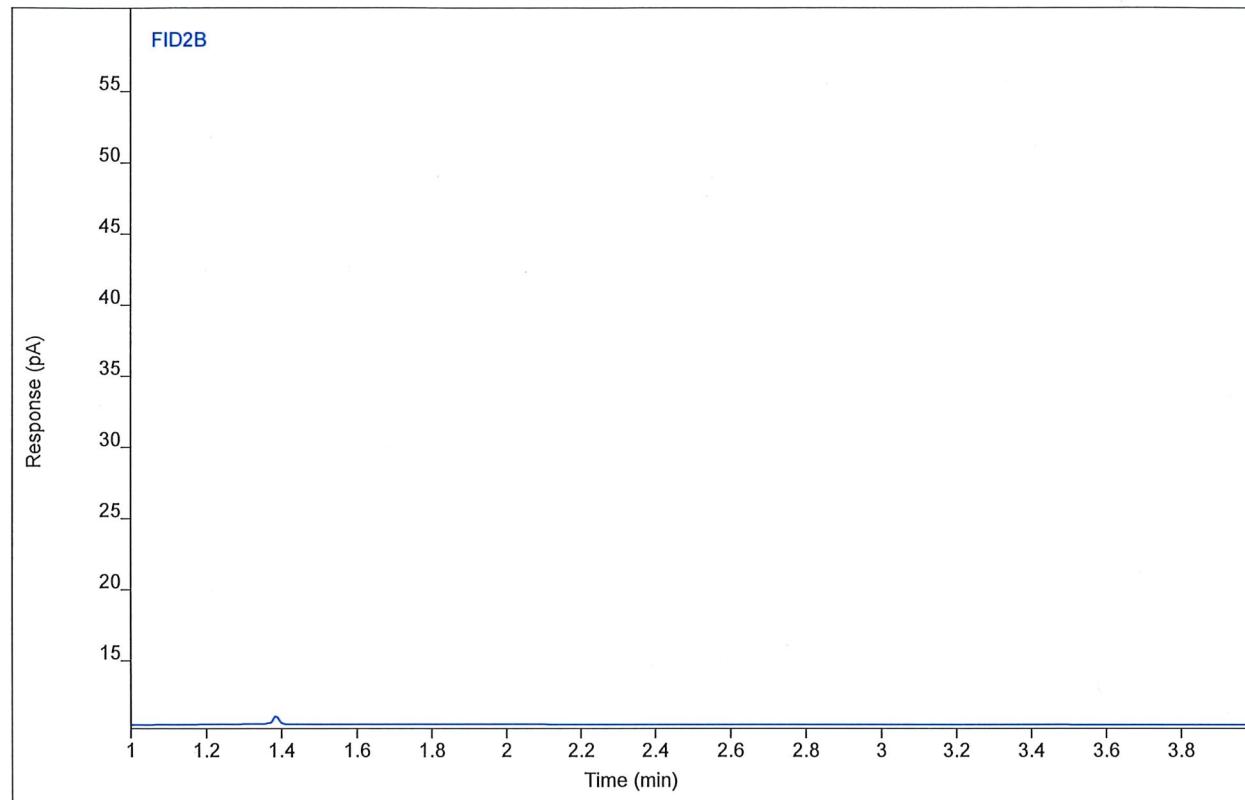
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 019B2001.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 1:47 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



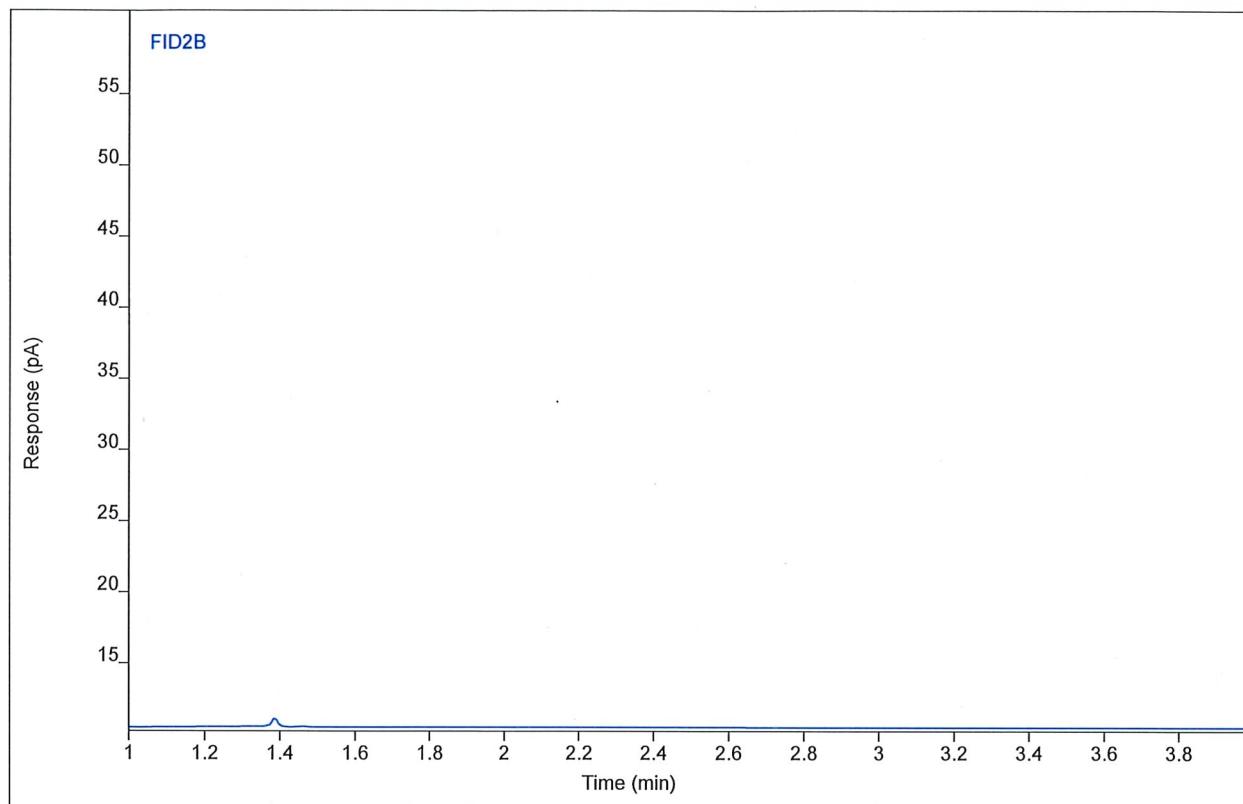
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 019B2002.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 1:55 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



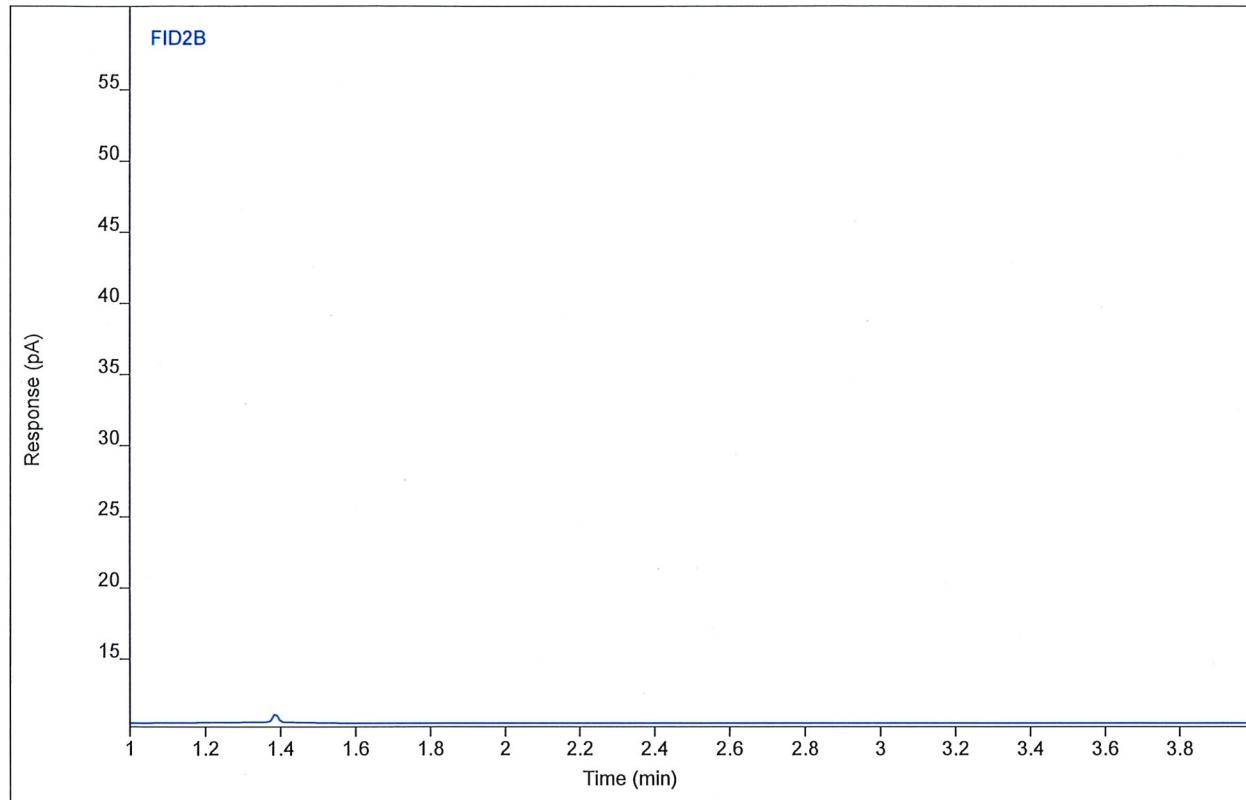
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 019B2003.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:02 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



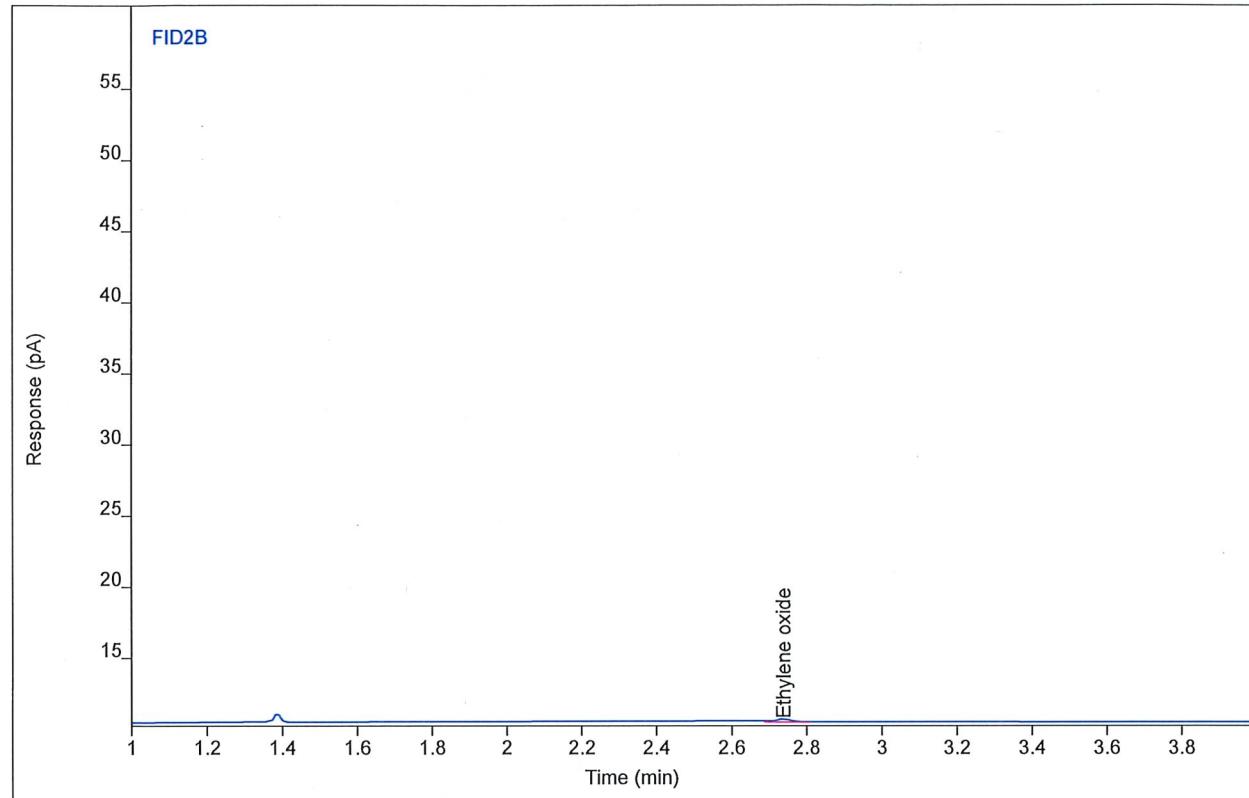
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.73) |      |        |        |    | 1       |      |

# Chromatogram Report

Sample Name 0219-044.Out 2-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 029B2101.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:10 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 29  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



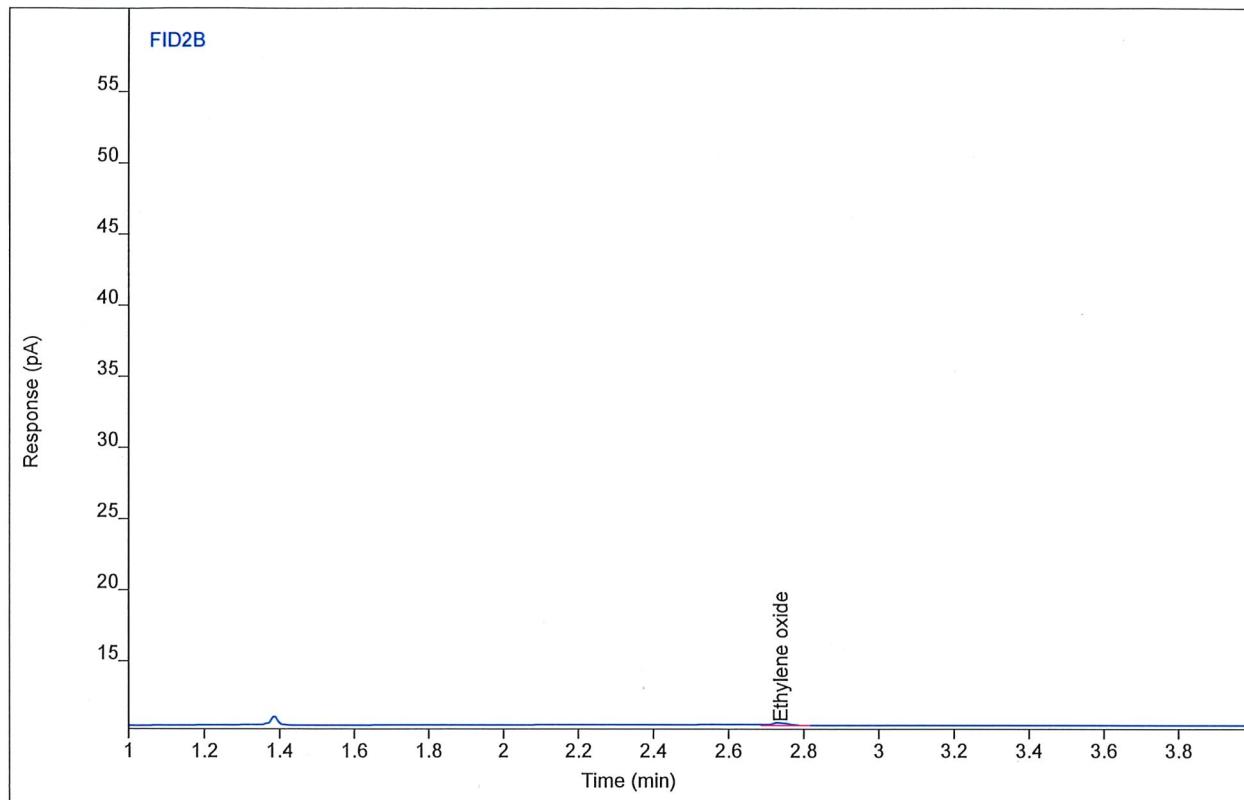
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 0.61671 | 0.21964 | 1.76793 | 1  | 1.76793 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 2-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 029B2102.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:18 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Nicholas Traversa

Sample Type Sample  
Vial Number Vial 29  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



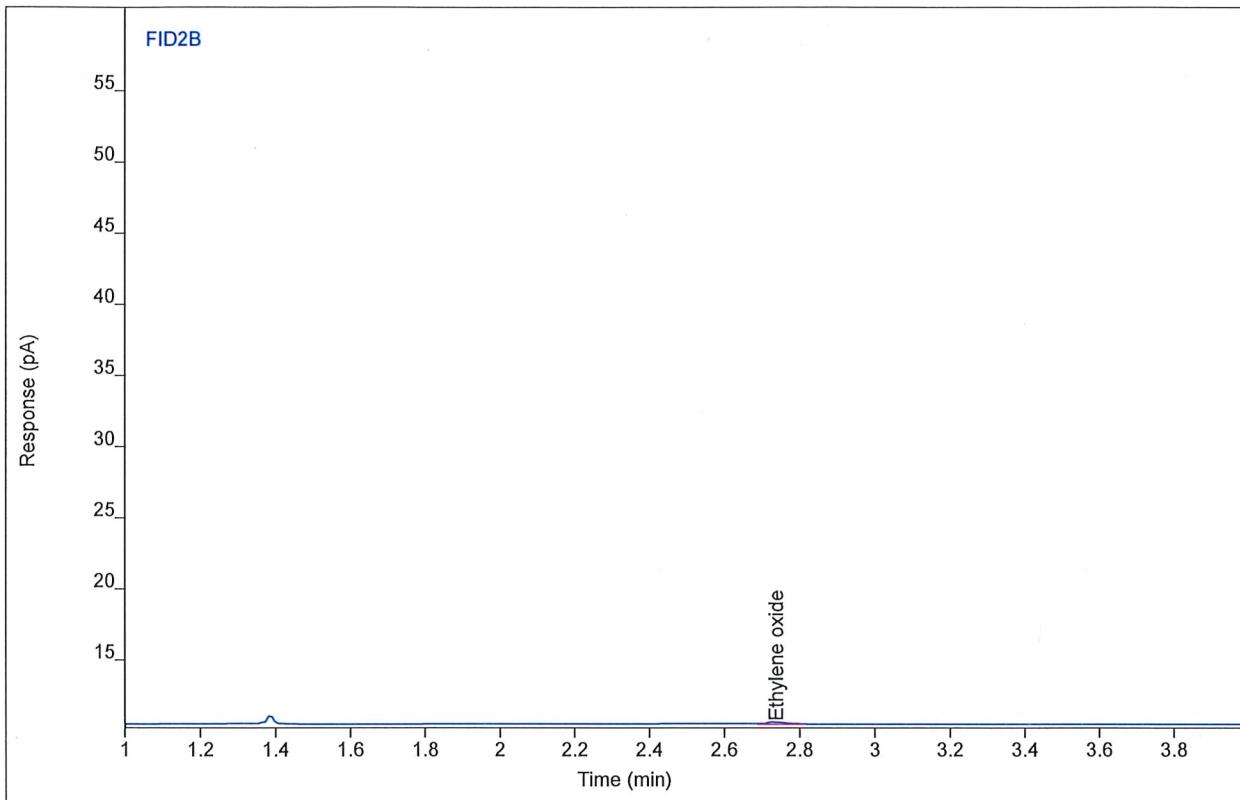
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 0.64128 | 0.23302 | 1.83836 | 1  | 1.83836 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 2-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 029B2103.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:25 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 29  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



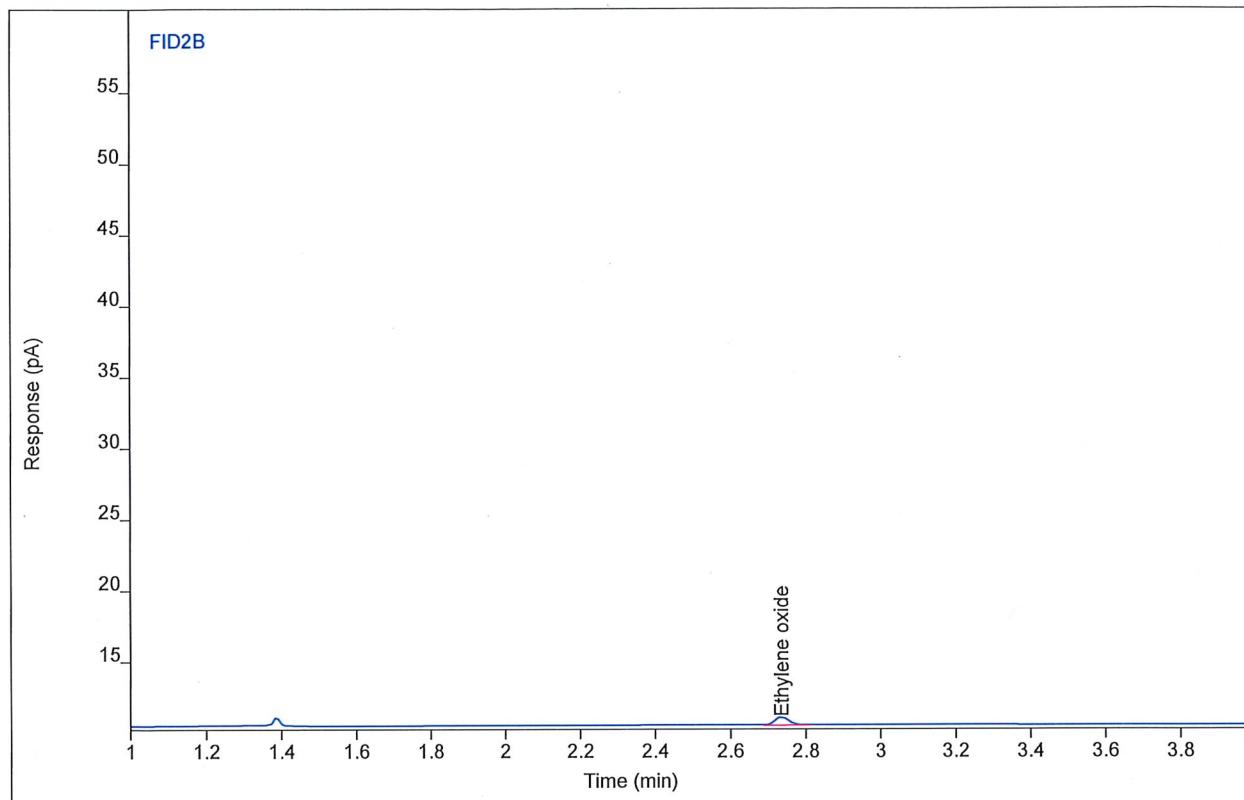
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 0.57846 | 0.22225 | 1.65827 | 1  | 1.65827 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 028B2201.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:33 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 28  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



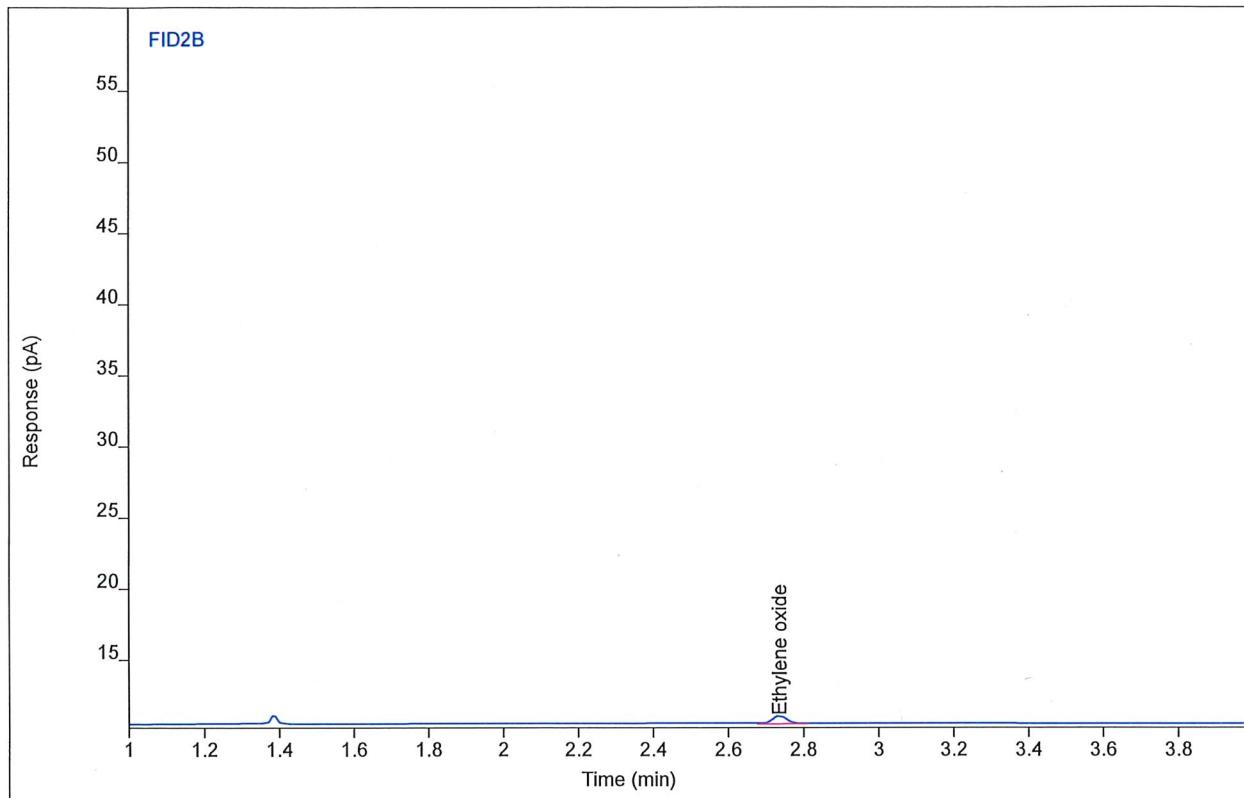
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.54652 | 0.57557 | 4.43344 | 1  | 4.43344 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 028B2202.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:40 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 28  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



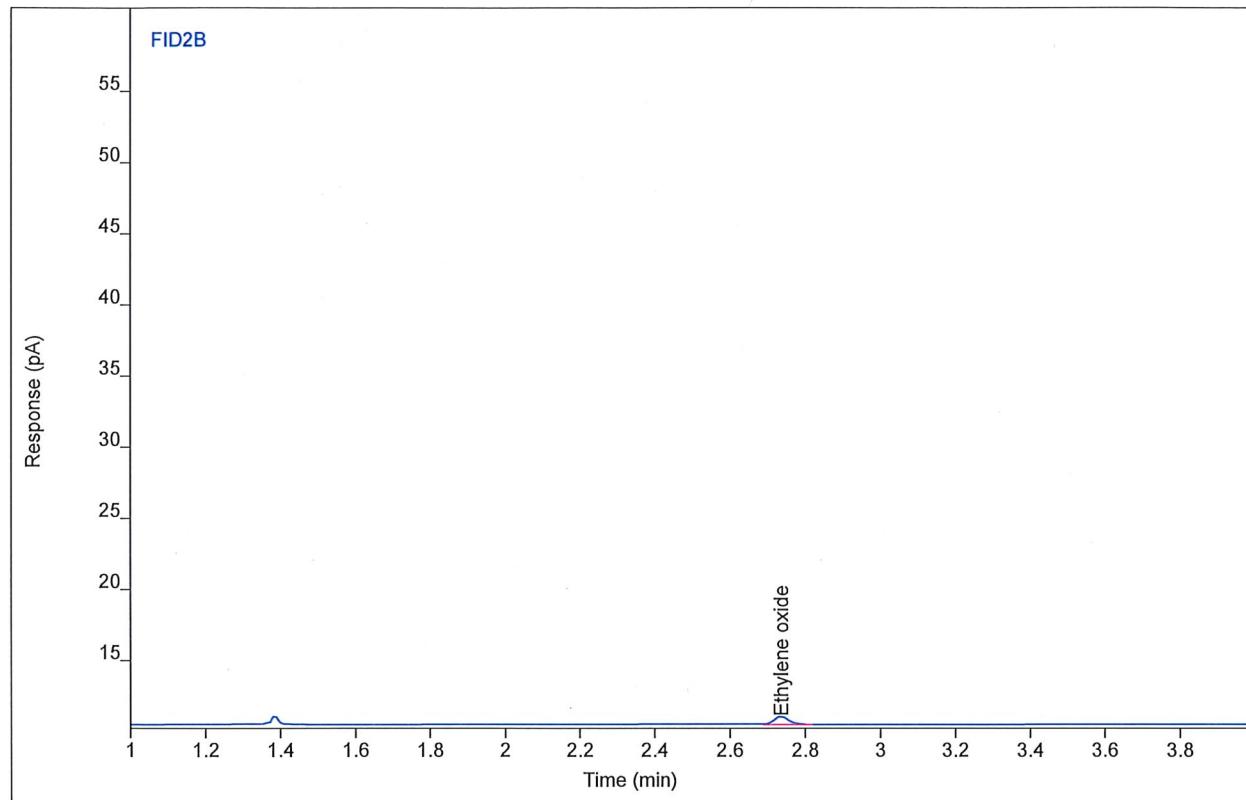
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.52749 | 0.57968 | 4.37889 | 1  | 4.37889 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 3-2.Bag  
Sequence Name BETTYP1031 1 ver.1  
Inj Data File 028B2203.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 2:48 PM  
File Modified 2/12/2019 7:31 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 28  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM

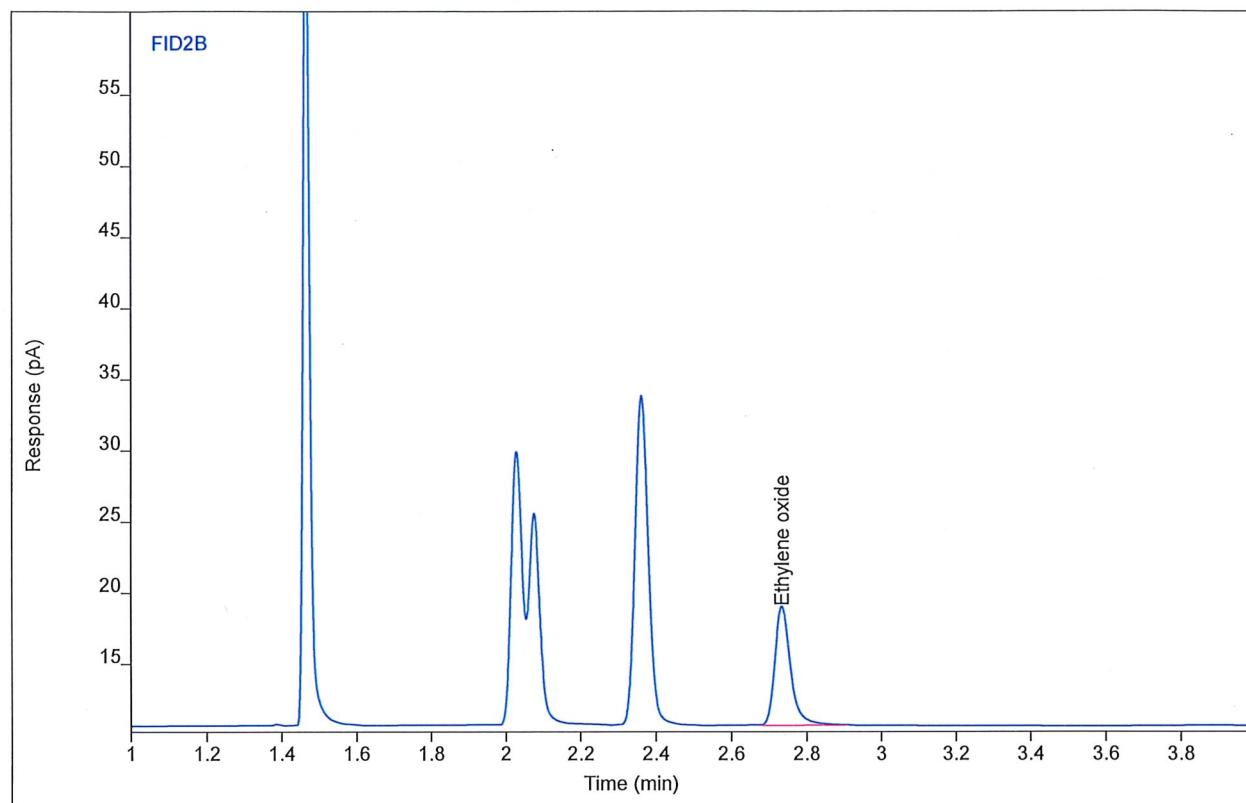


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.56285 | 0.57476 | 4.48026 | 1  | 4.48026 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                     |
|----------------|----------------------------------|--------------------|---------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration         |
| Sequence Name  | BETTYP1033 ver.2                 | Vial Number        | Vial 25             |
| Inj Data File  | 025B0102.D                       | Injection Volume   | 250                 |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 2 of 4              |
| Injection Date | 2/8/2019 3:44 PM                 | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 2/11/2019 8:21 AM                | Analysis Method    | BETTYP957_EO.M      |
| Instrument     |                                  | Method Modified    | 11/21/2018 12:33 PM |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:18 AM   |

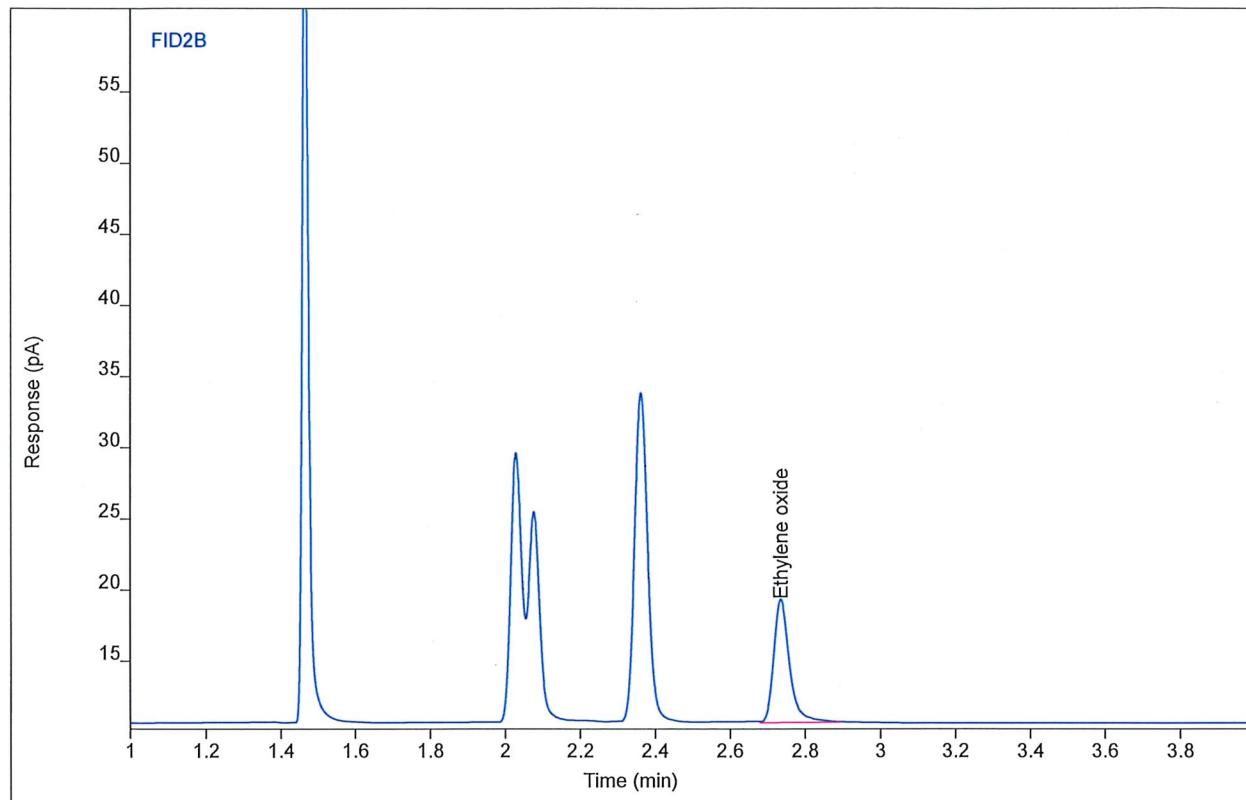


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 24.2846 | 8.38572 | 69.1280 | 1  | 69.1280 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                     |
|----------------|----------------------------------|--------------------|---------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration         |
| Sequence Name  | BETTYP1033 ver.2                 | Vial Number        | Vial 25             |
| Inj Data File  | 025B0103.D                       | Injection Volume   | 250                 |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 3 of 4              |
| Injection Date | 2/8/2019 4:08 PM                 | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 2/11/2019 8:21 AM                | Analysis Method    | BETTYP957_EO.M      |
| Instrument     |                                  | Method Modified    | 11/21/2018 12:33 PM |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:18 AM   |



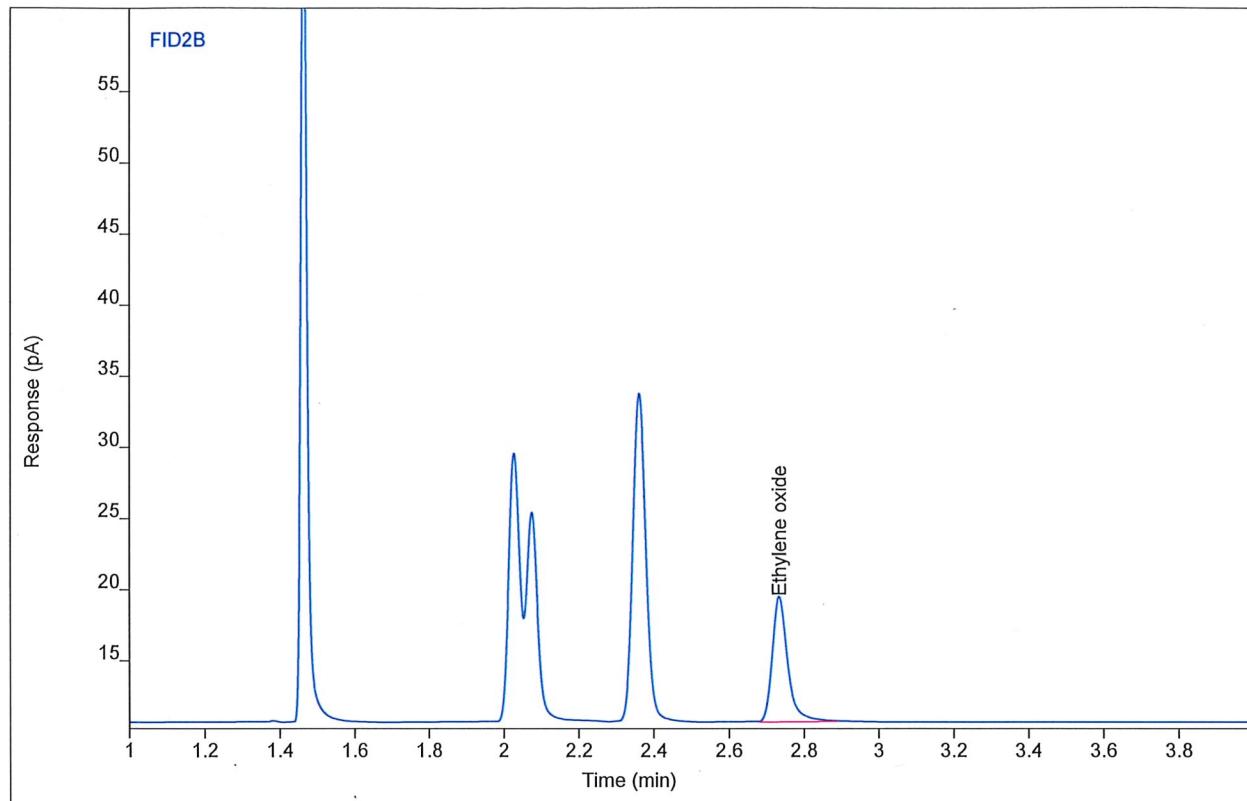
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 25.1530 | 8.66442 | 71.5988 | 1  | 71.5988 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1033 ver.2  
Inj Data File 025B0104.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/8/2019 4:33 PM  
File Modified 2/11/2019 8:21 AM  
Instrument  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/21/2018 12:33 PM  
Printed 2/15/2019 9:18 AM



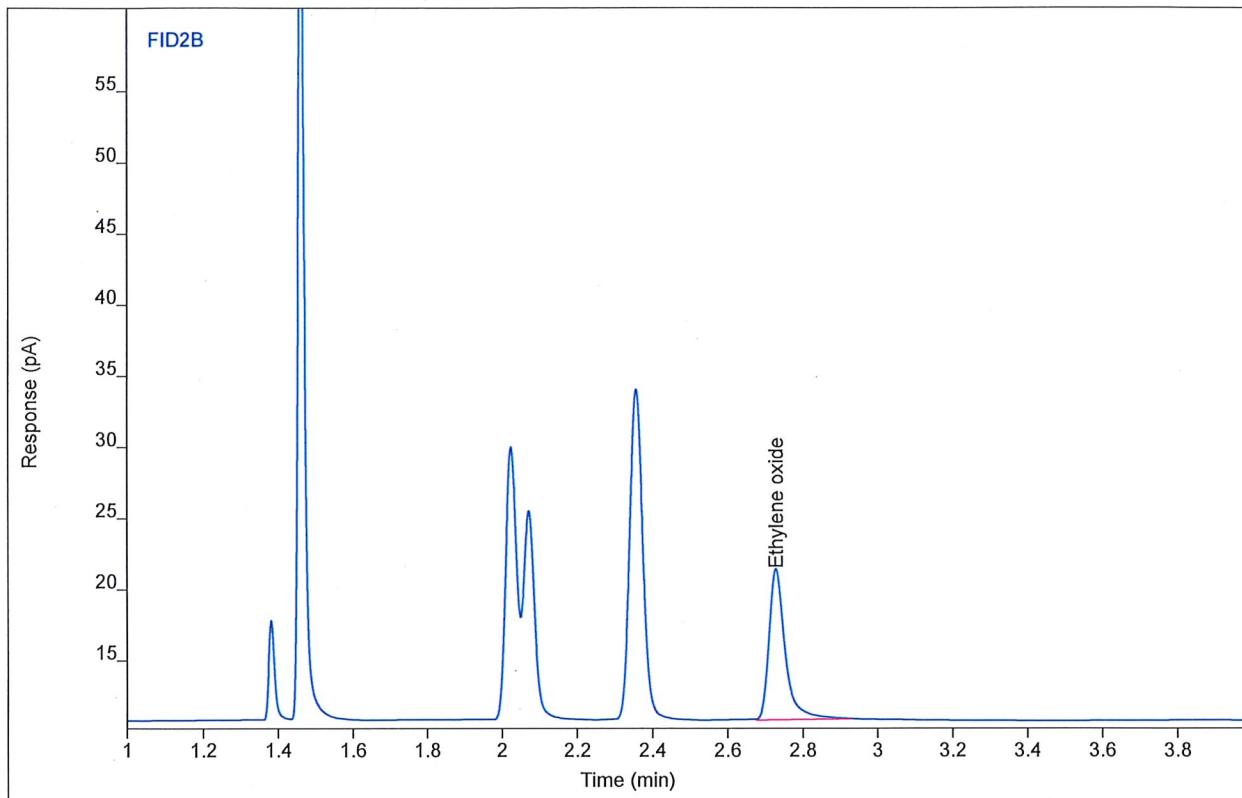
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 25.6166 | 8.81481 | 72.9175 | 1  | 72.9175 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_030\_025B2302.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/11/2019 1:20 AM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 4  
Injection GC142P133\_CAL.M  
Acquisition Method BETTYP1038\_EO\_COMBINED.M  
Analysis Method 1/2/2014 5:30 PM  
Method Modified 2/15/2019 9:18 AM  
Printed

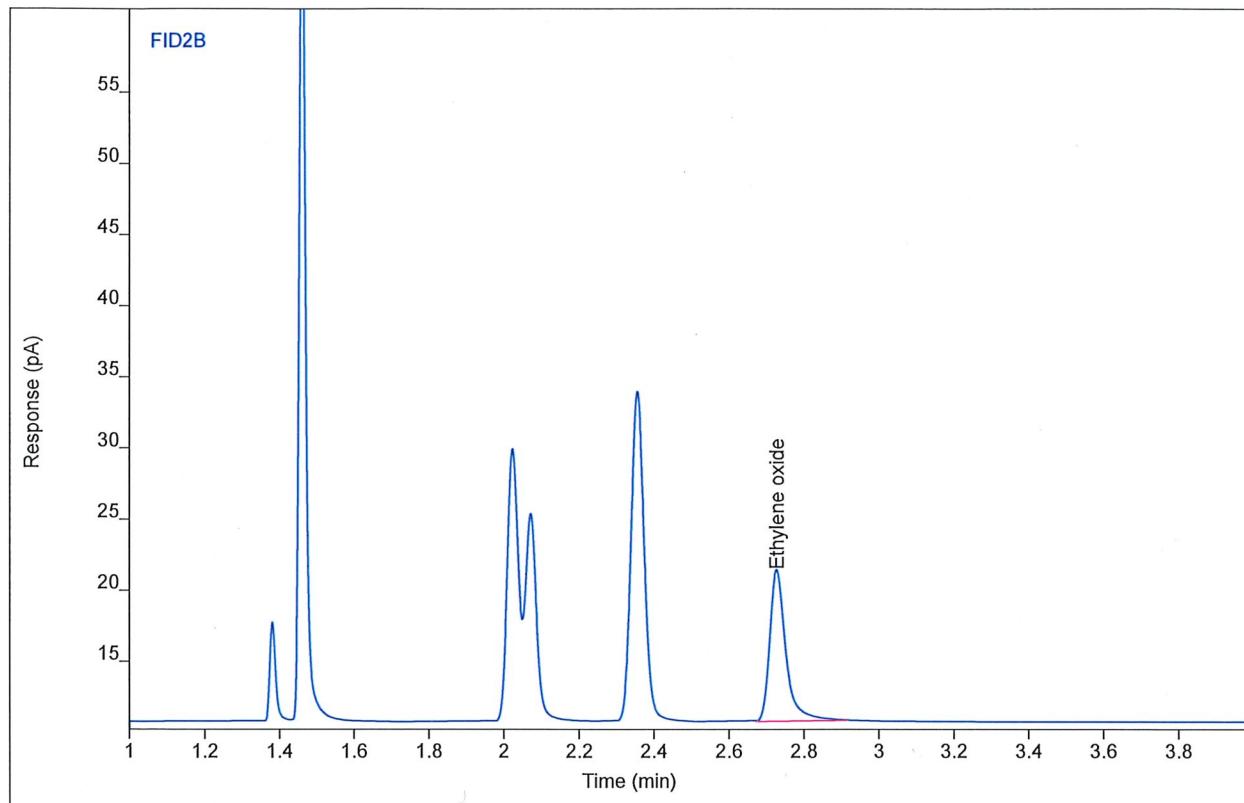


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 32.1570 | 10.6309 | 83.0305 | 1  | 83.0305 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                          |
|----------------|----------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration              |
| Sequence Name  | BettyP1033 R1 ver.3              | Vial Number        | Vial 25                  |
| Inj Data File  | _031_025B2303.D                  | Injection Volume   | 250                      |
| File Location  | GC/2019/Rosie/Quarter 1          | Injection          | 3 of 4                   |
| Injection Date | 2/11/2019 1:45 AM                | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/13/2019 9:18 AM                | Analysis Method    | BETTYP1038_EO_COMBINED.M |
| Instrument     | Betty                            | Method Modified    | 1/2/2014 5:30 PM         |
| Operator       | Nicholas Traversa                | Printed            | 2/15/2019 9:18 AM        |



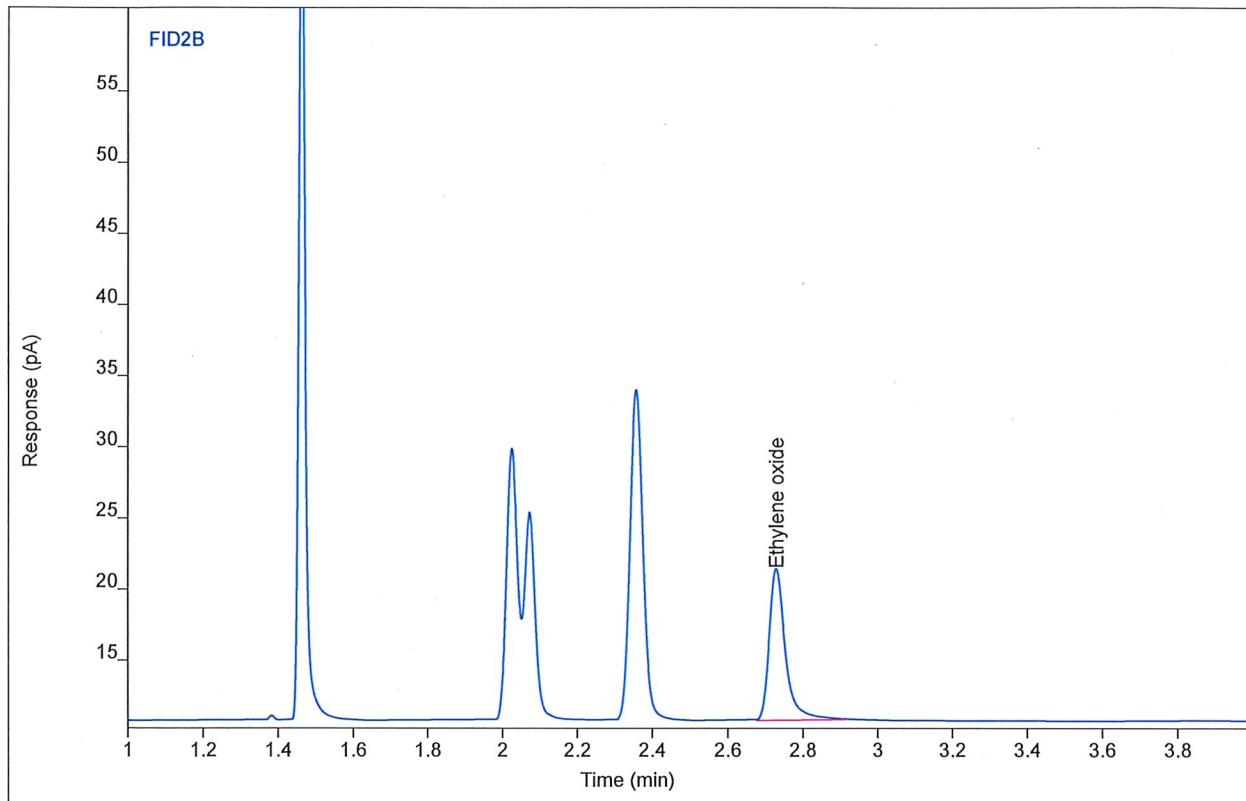
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 32.0646 | 10.6561 | 82.7949 | 1  | 82.7949 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_032\_025B2304.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/11/2019 2:10 AM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/15/2019 9:18 AM



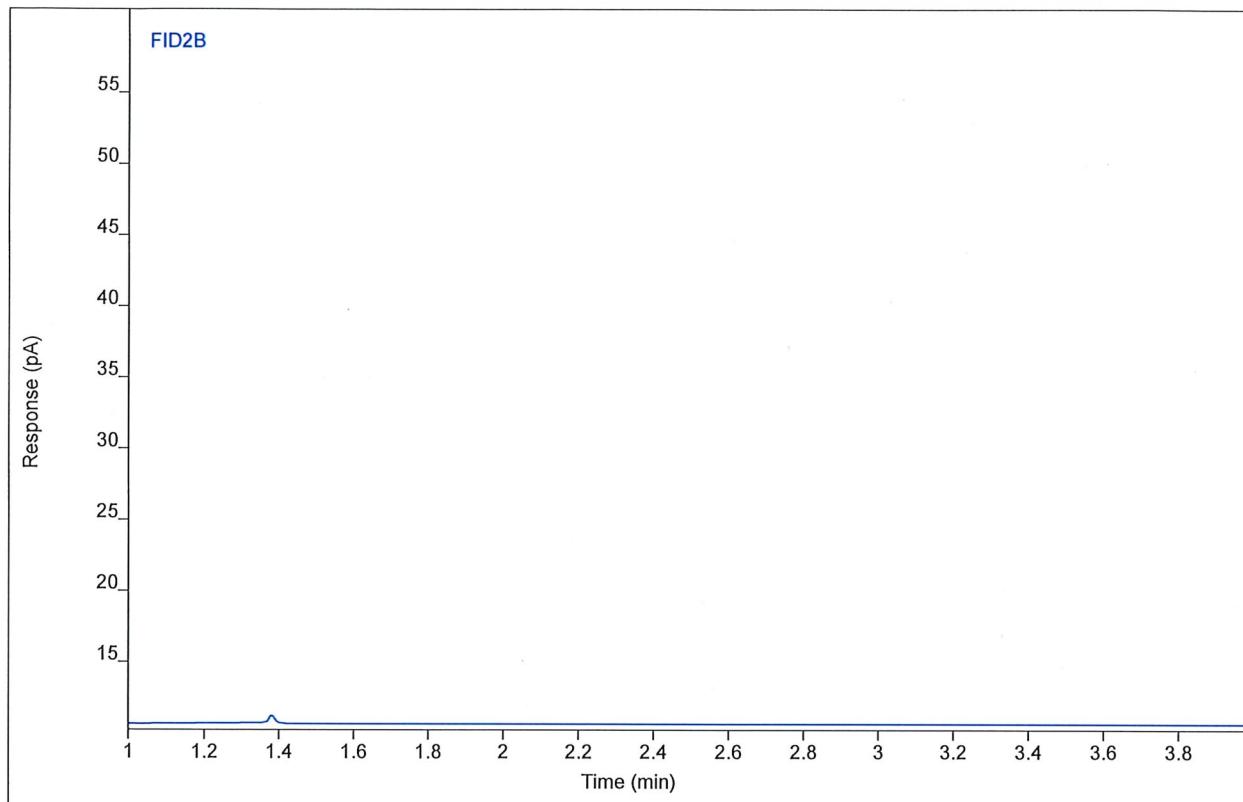
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 31.9690 | 10.6652 | 82.5509 | 1  | 82.5509 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6 D.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0101.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 11:06 AM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



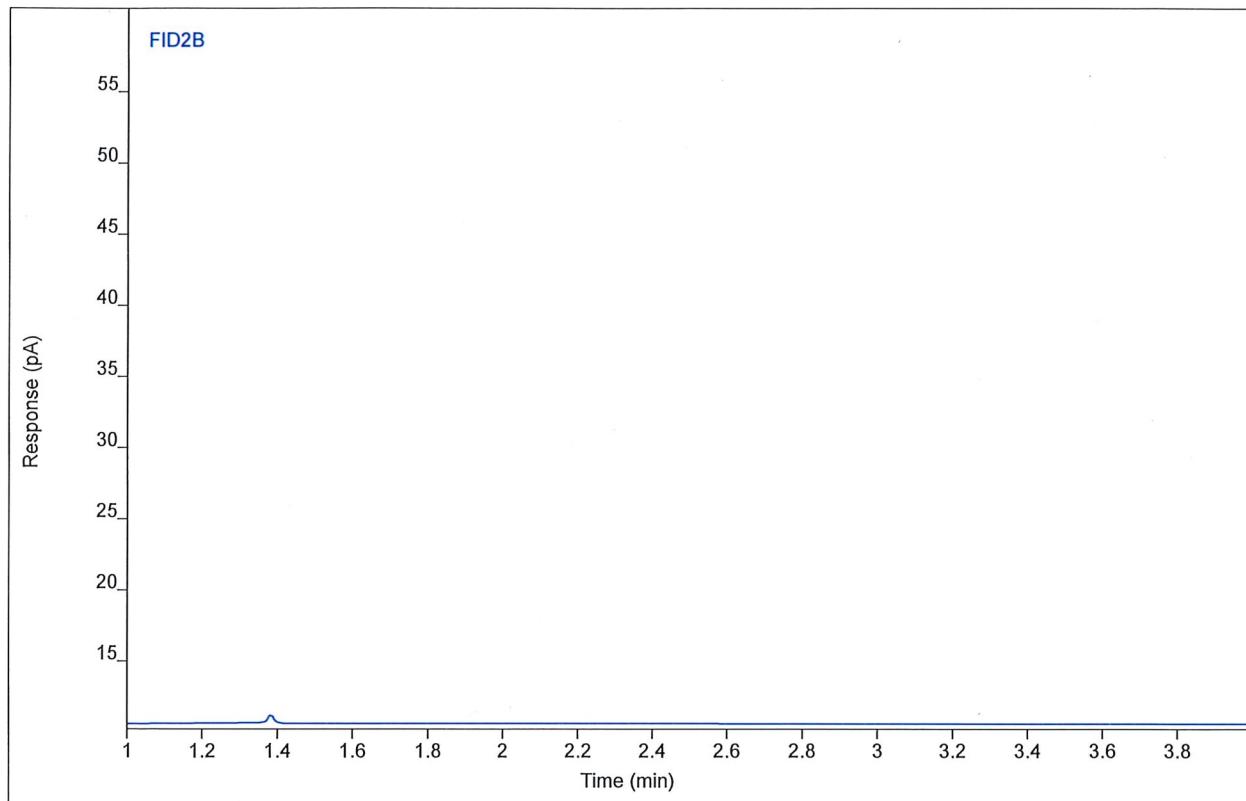
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.74) |      |        |        | 1  |         |      |

# Chromatogram Report

Sample Name 0219-044.Out 1-6 D.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0102.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 11:13 AM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



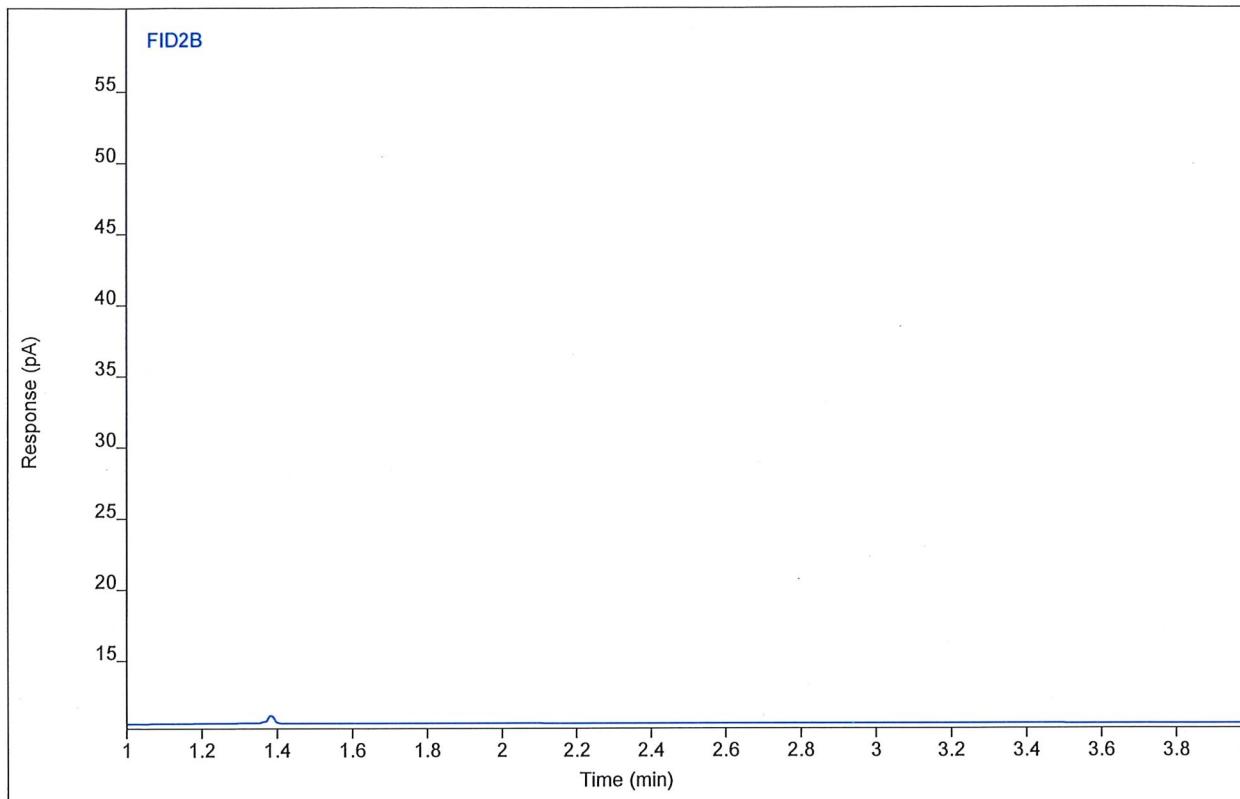
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.74) |      |        |        |    | 1       |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6 D.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0103.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 11:21 AM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



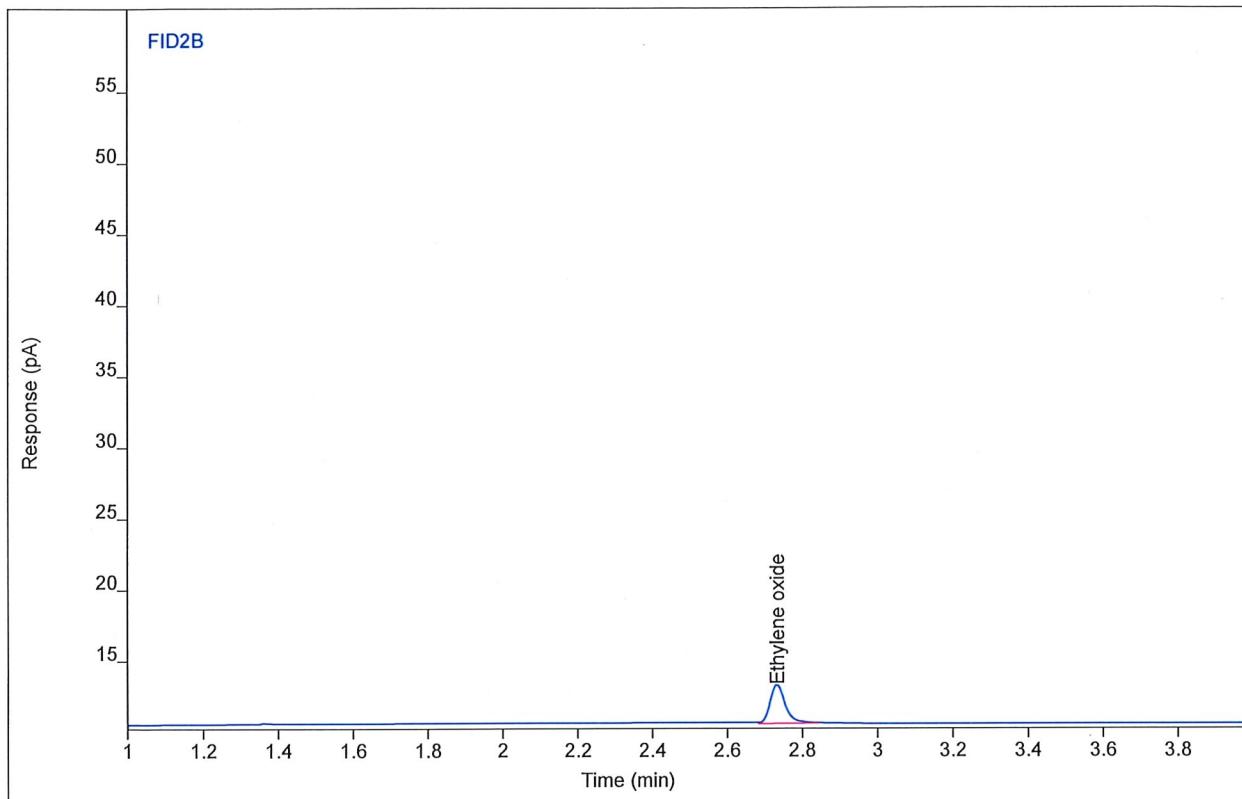
| Compound       | Type | RT     | Area | Height | Amount | DF | SampAmt | Unit |
|----------------|------|--------|------|--------|--------|----|---------|------|
| Ethylene oxide |      | (2.74) |      |        |        | 1  |         |      |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-1 BL.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0201.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 11:28 AM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



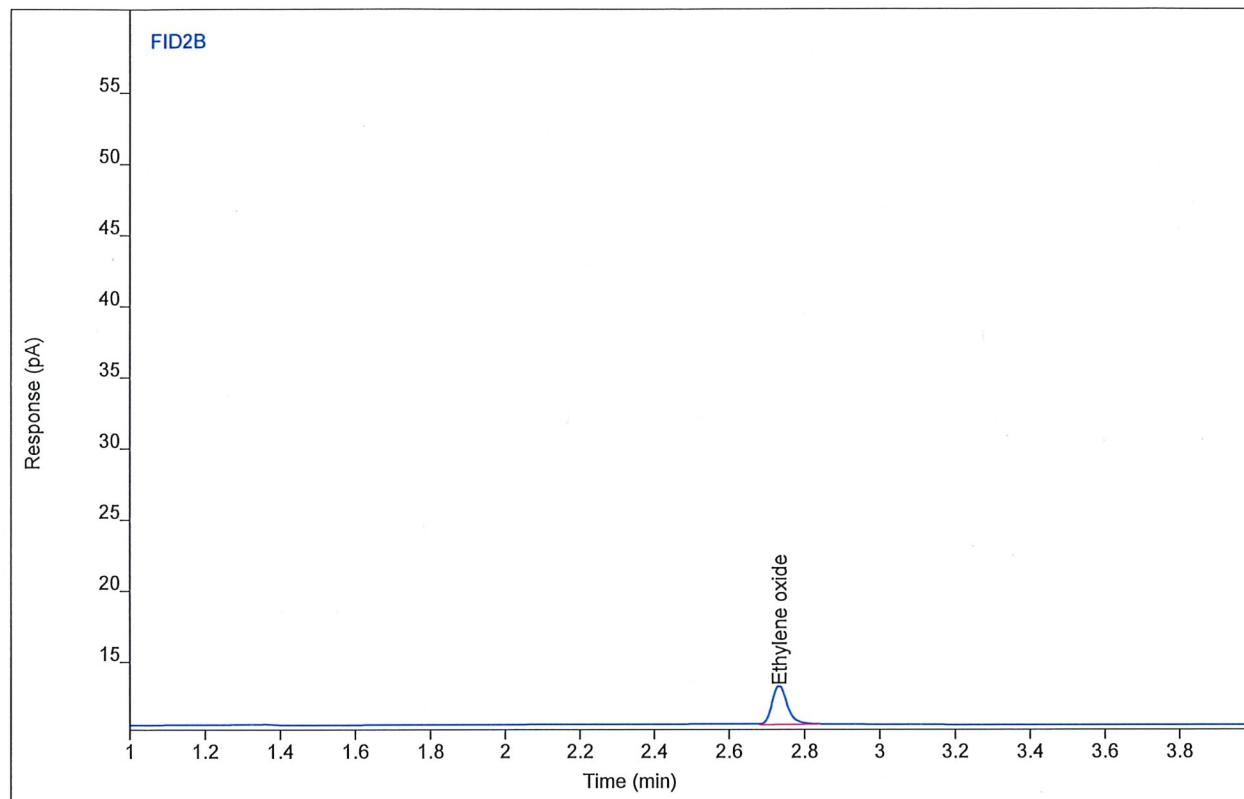
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 7.67730 | 2.71500 | 20.5965 | 21 | 432.527 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-1 BL.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0202.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 11:36 AM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



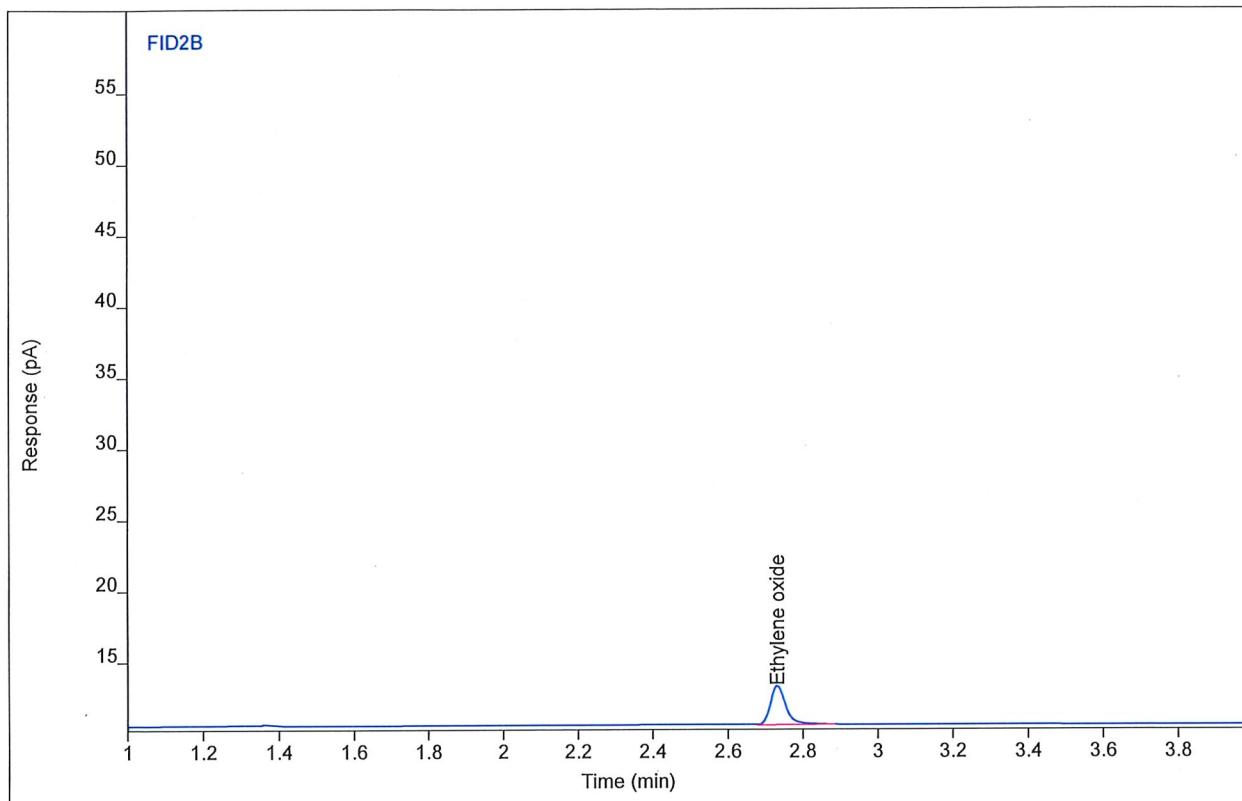
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 7.71307 | 2.75159 | 20.6878 | 21 | 434.443 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-1 BL.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0203.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 11:44 AM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



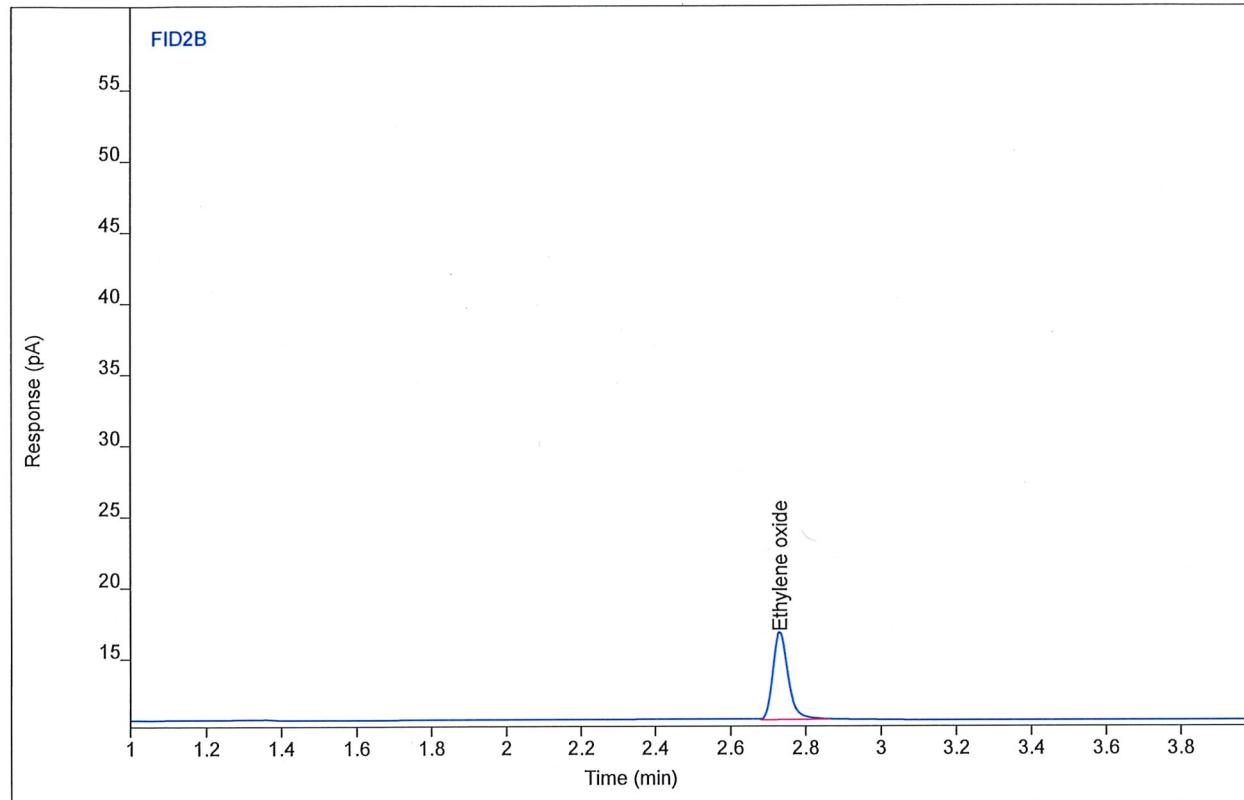
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 7.76293 | 2.74558 | 20.8149 | 21 | 437.113 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-3 BL.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 12:55 PM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



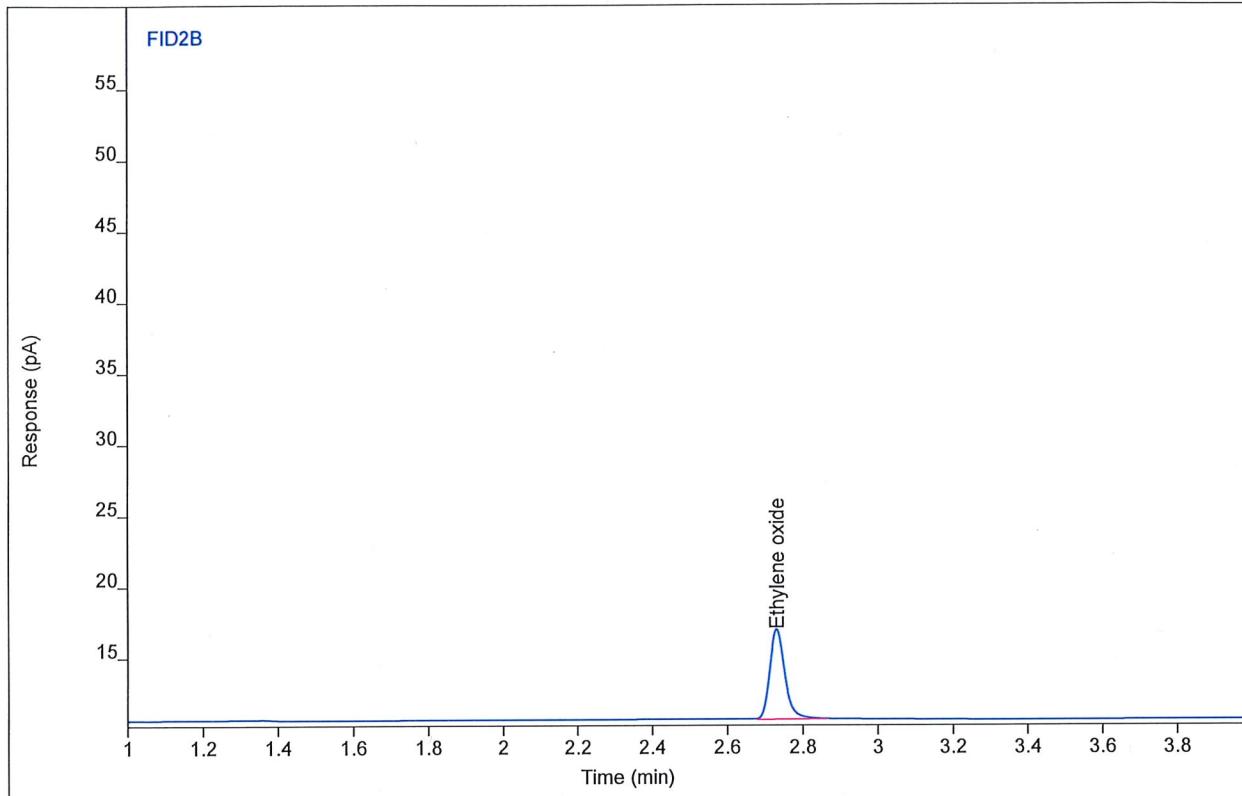
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 17.2438 | 6.18554 | 44.9953 | 21 | 944.901 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-3 BL.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 1:03 PM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



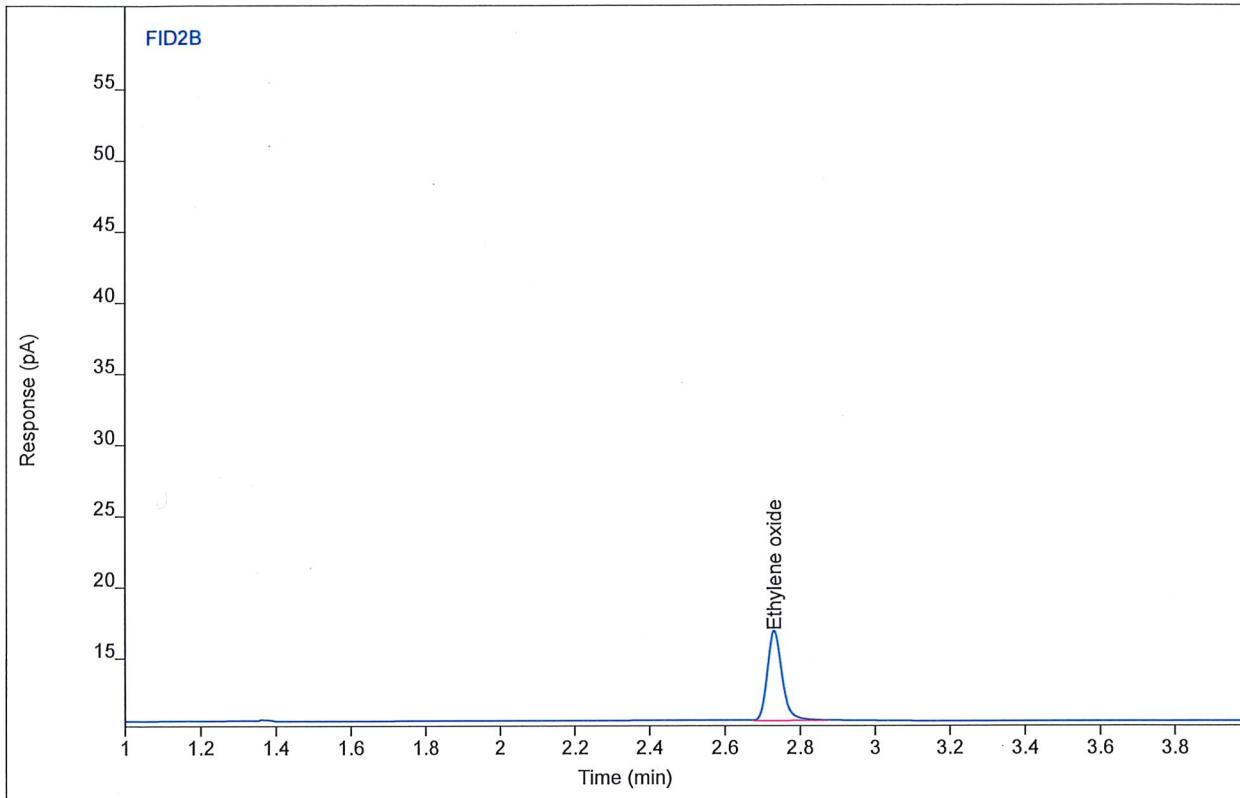
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 17.6122 | 6.33315 | 45.9348 | 21 | 964.631 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-3 BL.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 1:10 PM  
File Modified 2/13/2019 6:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



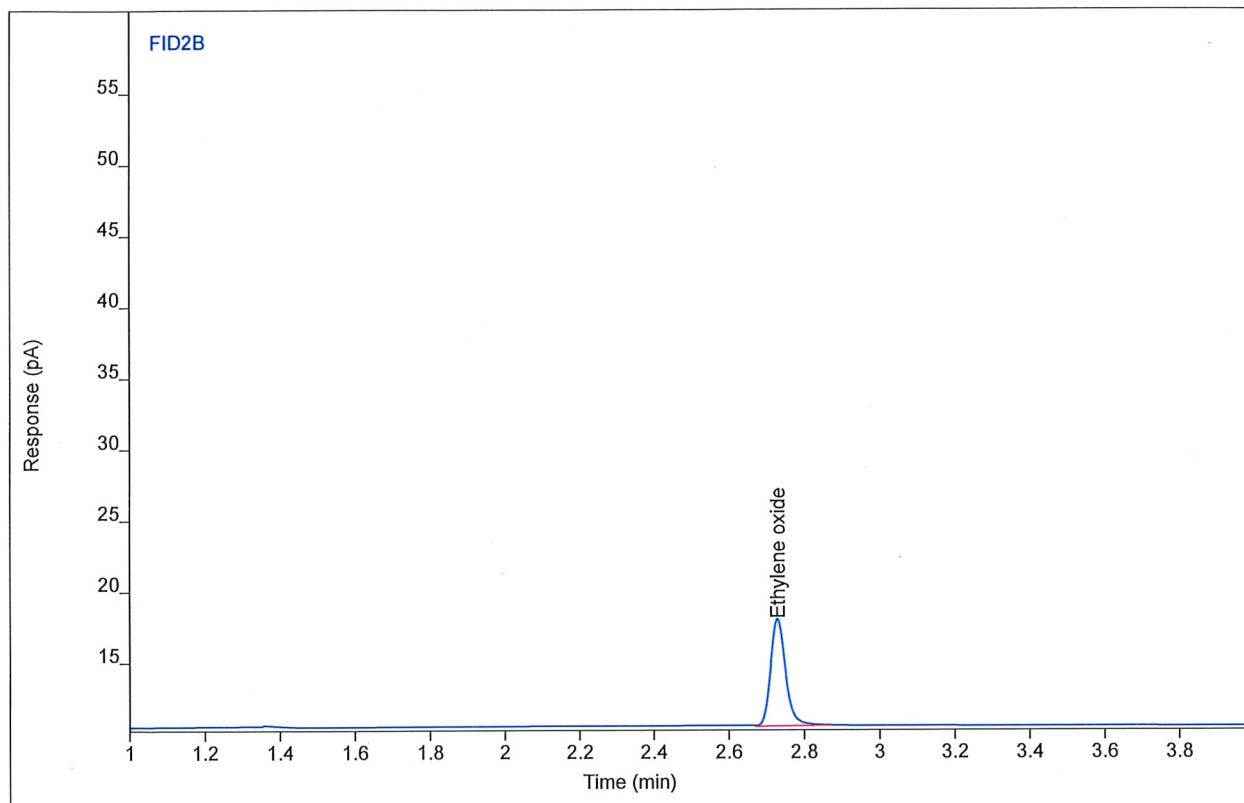
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 17.4526 | 6.33229 | 45.5278 | 21 | 956.085 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-5 D.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0801.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 2:06 PM  
File Modified 2/13/2019 10:20 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



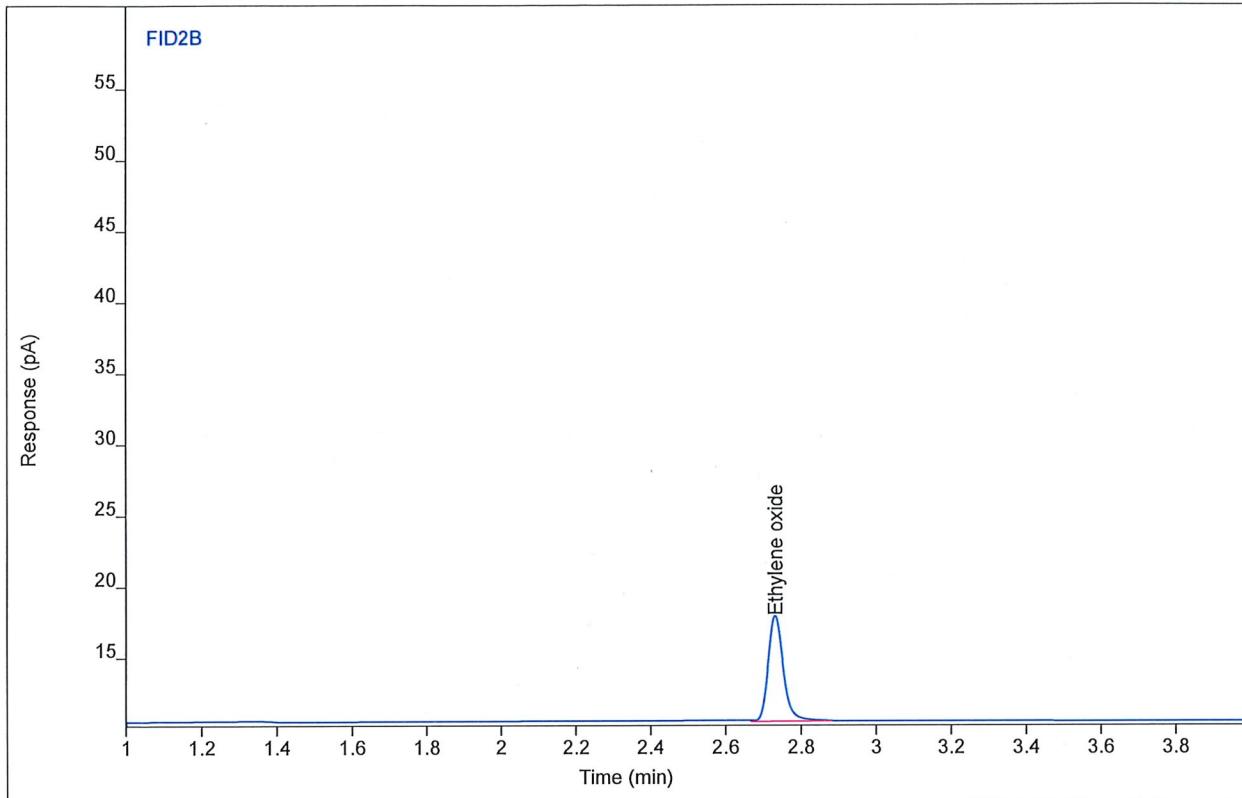
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 20.8159 | 7.53462 | 54.1057 | 21 | 1136.22 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-5 D.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0802.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 2:14 PM  
File Modified 2/13/2019 10:20 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



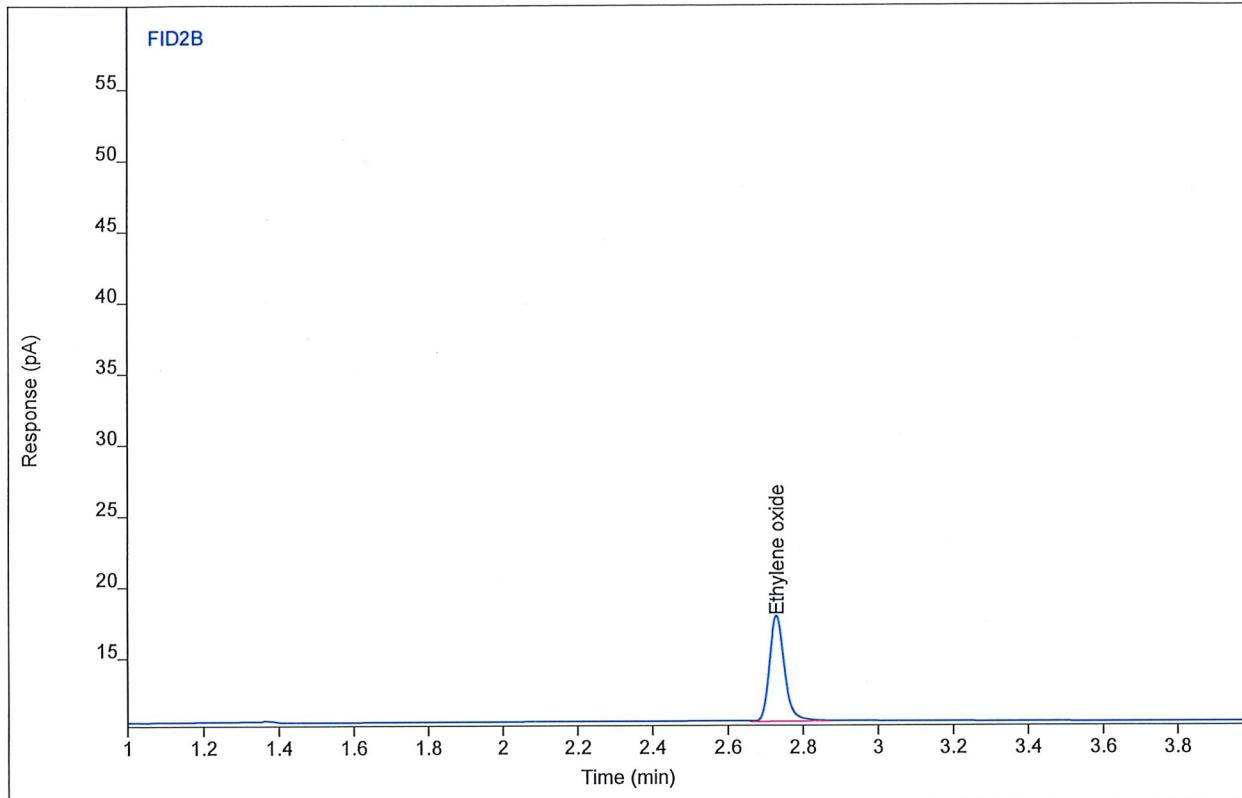
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 20.5965 | 7.42226 | 53.5462 | 21 | 1124.47 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-5 D.Bag  
Sequence Name BETTYP1036 ver.3  
Inj Data File 019B0803.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/11/2019 2:21 PM  
File Modified 2/13/2019 10:20 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



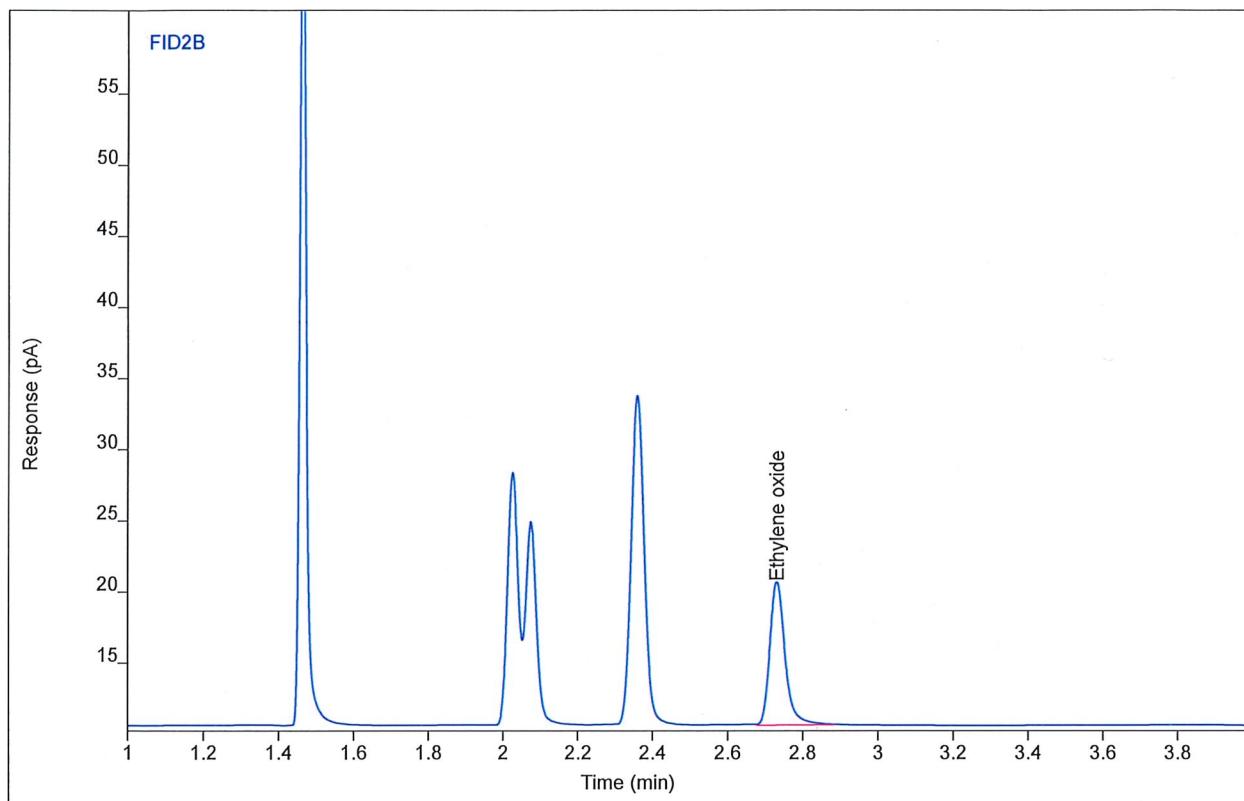
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 20.6134 | 7.44339 | 53.5891 | 21 | 1125.37 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1036 ver.3  
Inj Data File 025B1302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 5:01 AM  
File Modified 2/13/2019 6:29 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial Number Calibration  
Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.4476 | 10.0935 | 73.5699 | 1  | 73.5699 | ppm  |

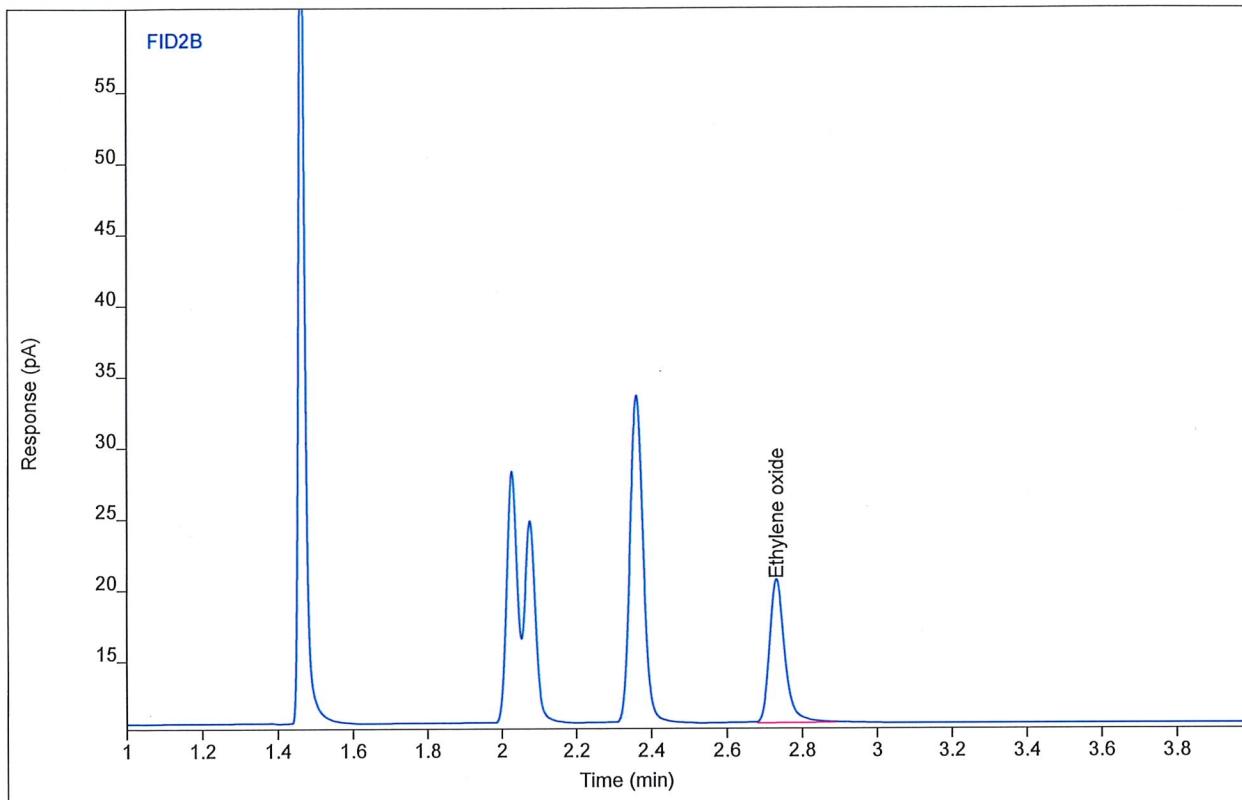
# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1036 ver.3  
Inj Data File 025B1303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 5:26 AM  
File Modified 2/13/2019 6:29 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type  
Vial Number  
Injection Volume  
Injection  
Acquisition Method  
Analysis Method  
Method Modified  
Printed

Calibration  
Vial 25  
250  
3 of 4  
GC142P133\_CAL.M  
BETTYP1038\_EO\_COMBINED.M  
2/13/2019 6:17 AM  
2/15/2019 9:18 AM



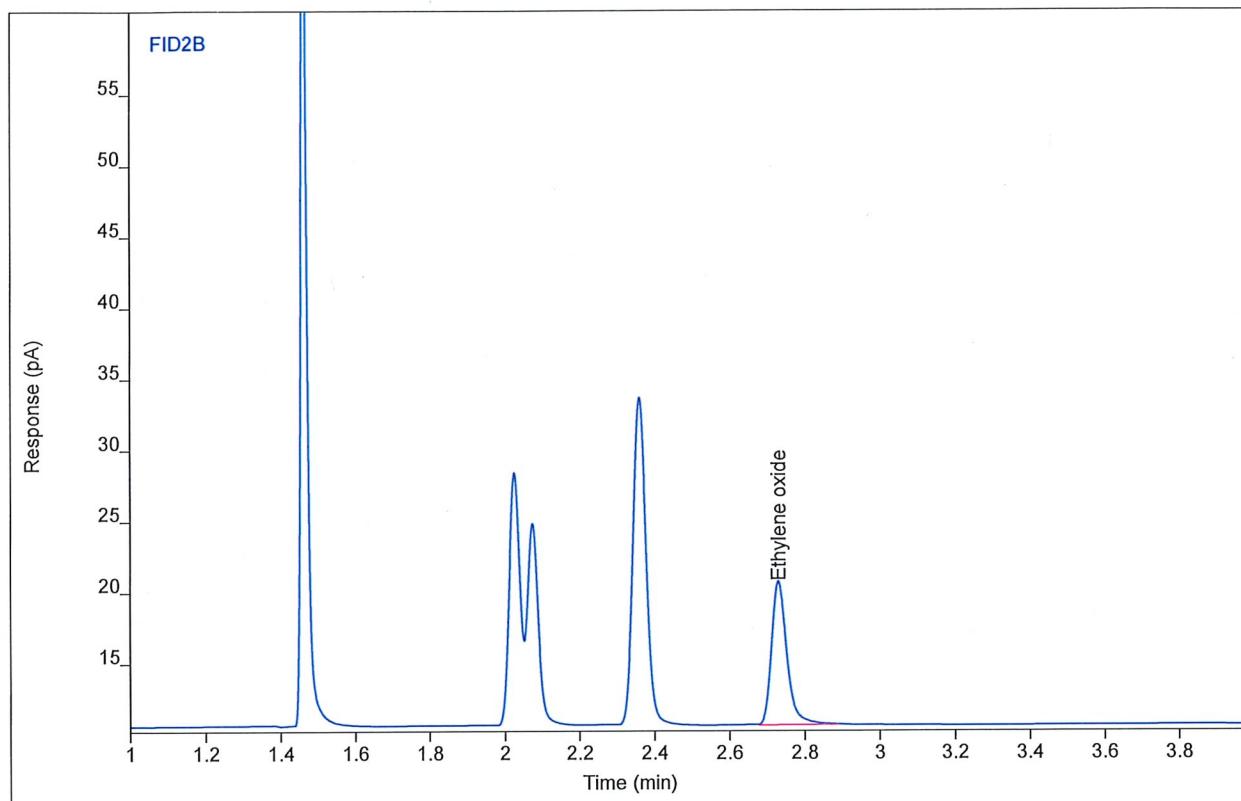
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.5367 | 10.0901 | 73.7971 | 1  | 73.7971 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1036 ver.3  
Inj Data File 025B1304.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 5:50 AM  
File Modified 2/13/2019 6:29 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Vial Number  
Calibration Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/15/2019 9:18 AM



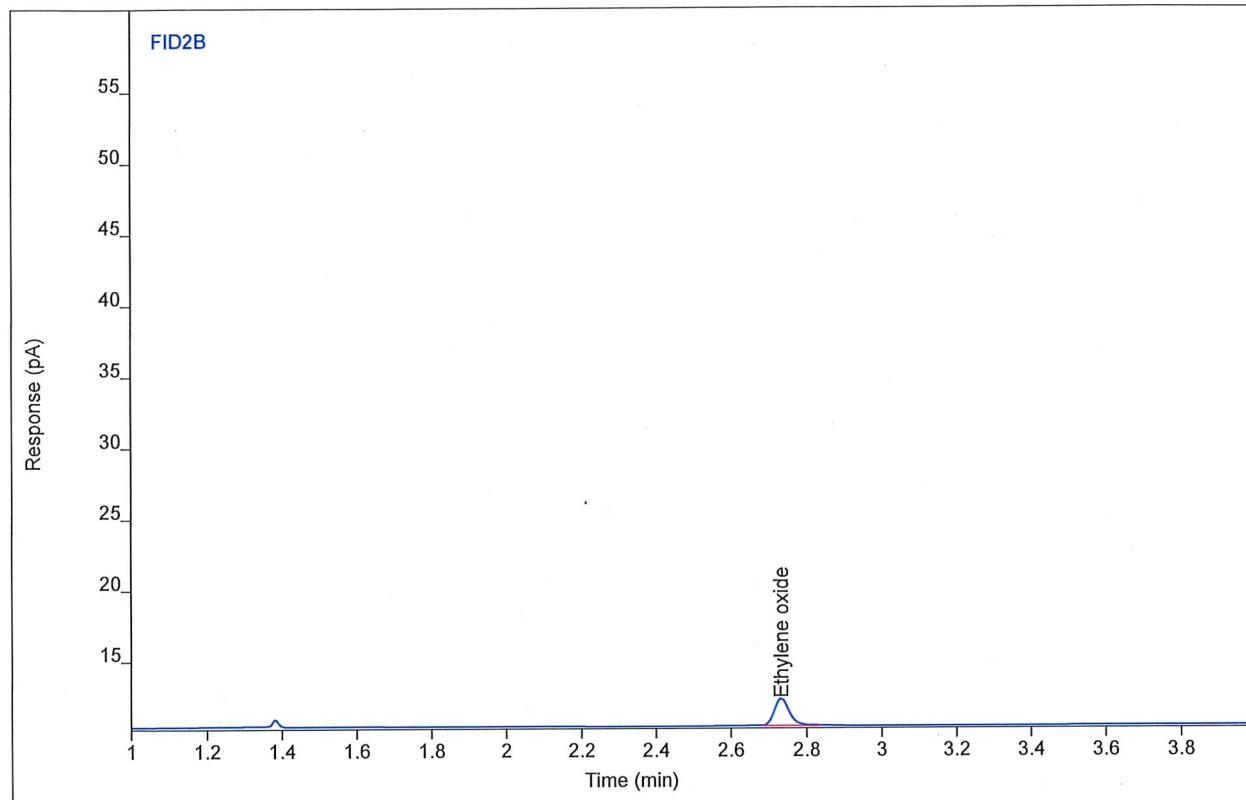
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.6178 | 10.1042 | 74.0039 | 1  | 74.0039 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6 D SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 019B0602.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 4:47 PM  
File Modified 2/14/2019 11:54 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 2/13/2019 6:09 AM  
Printed 2/15/2019 9:19 AM



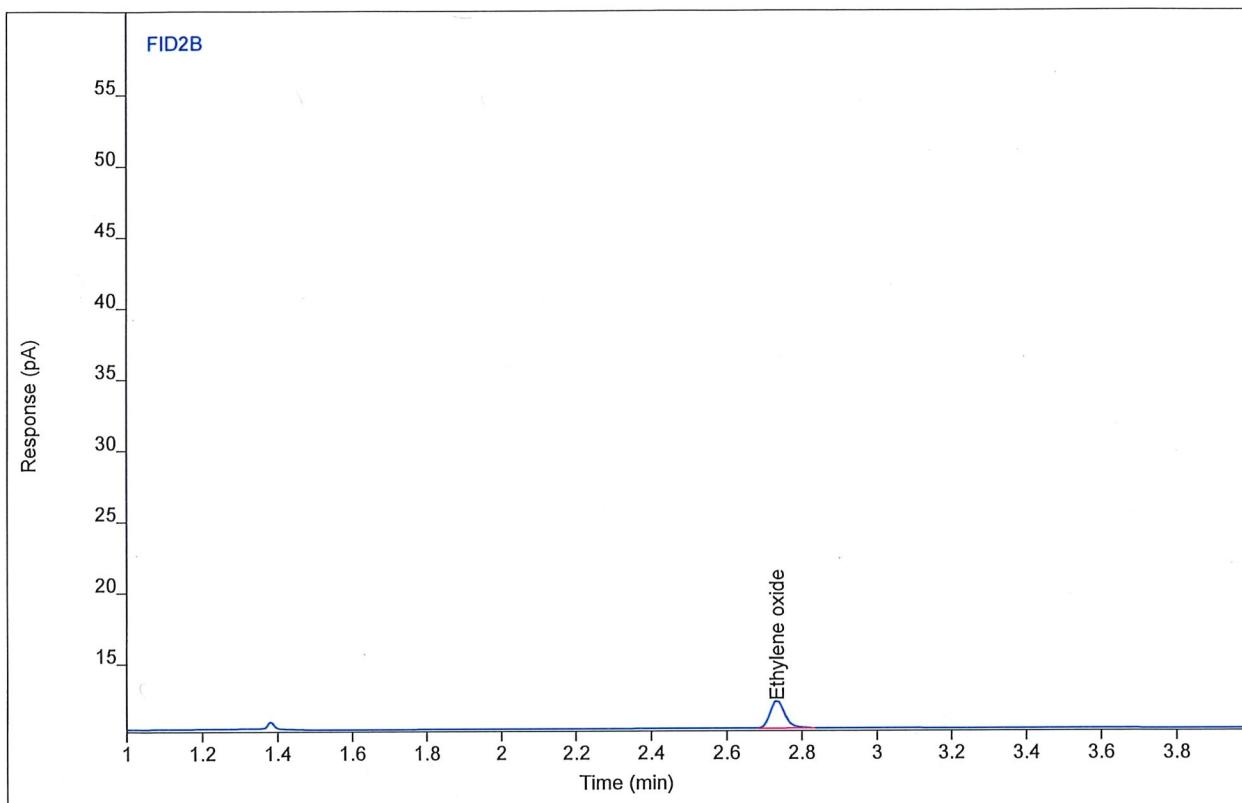
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.28579 | 1.92078 | 15.5584 | 1  | 15.5584 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6 D SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 019B0603.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 5:09 PM  
File Modified 2/14/2019 11:54 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 2/13/2019 6:09 AM  
Printed 2/15/2019 9:19 AM



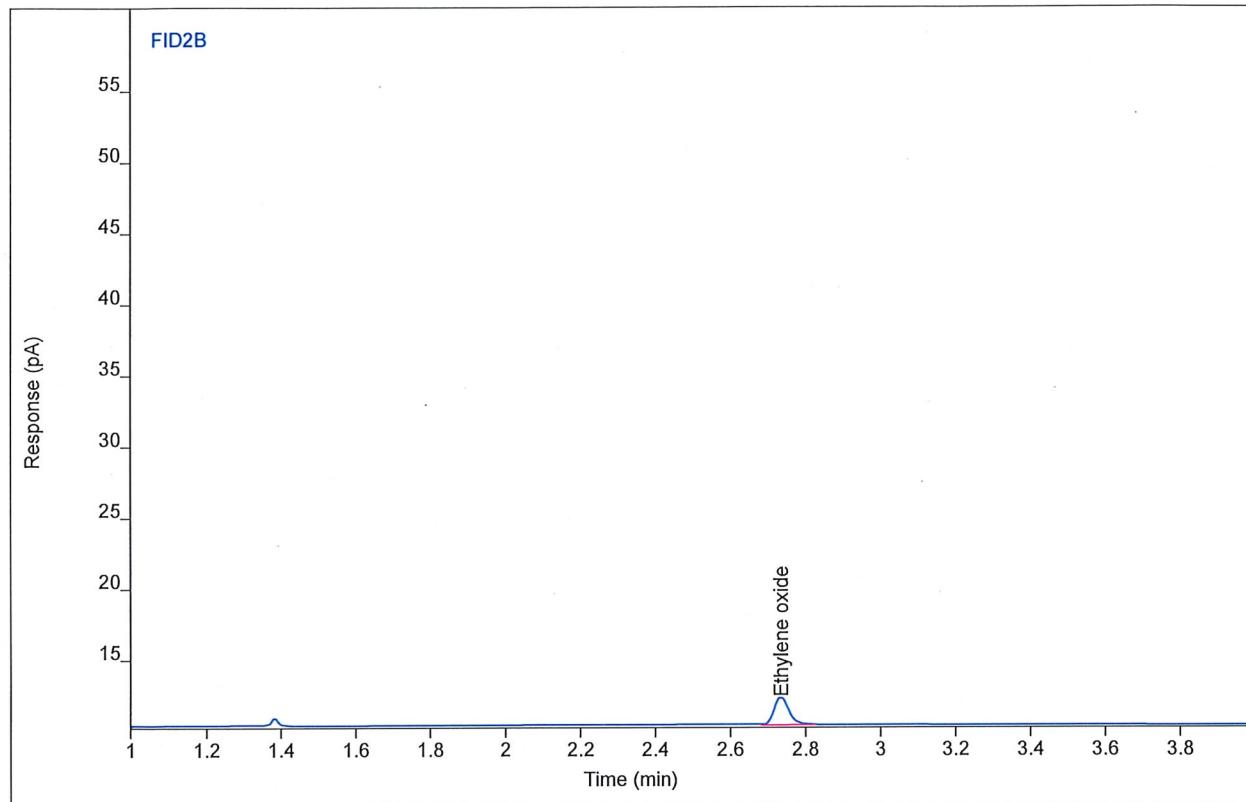
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.36664 | 1.95329 | 15.7829 | 1  | 15.7829 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-6 D SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 019B0604.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 5:31 PM  
File Modified 2/14/2019 11:54 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 2/13/2019 6:09 AM  
Printed 2/15/2019 9:19 AM

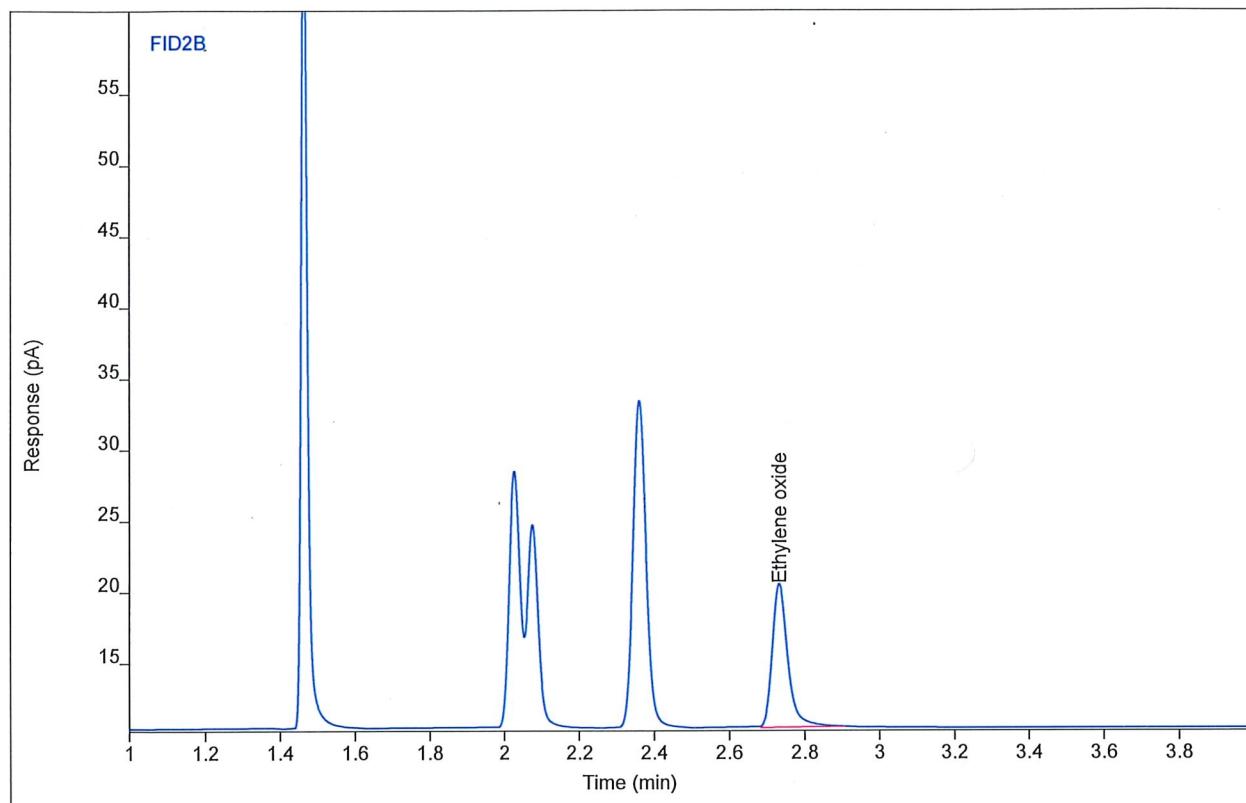


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.35985 | 1.95341 | 15.7640 | 1  | 15.7640 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                   |
|----------------|----------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration       |
| Sequence Name  | BETTYP1038 ver.4                 | Vial Number        | Vial 25           |
| Inj Data File  | 025B1302.D                       | Injection Volume   | 250               |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 2 of 4            |
| Injection Date | 2/13/2019 5:12 AM                | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/14/2019 11:55 AM               | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                            | Method Modified    | 2/13/2019 6:09 AM |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:19 AM |



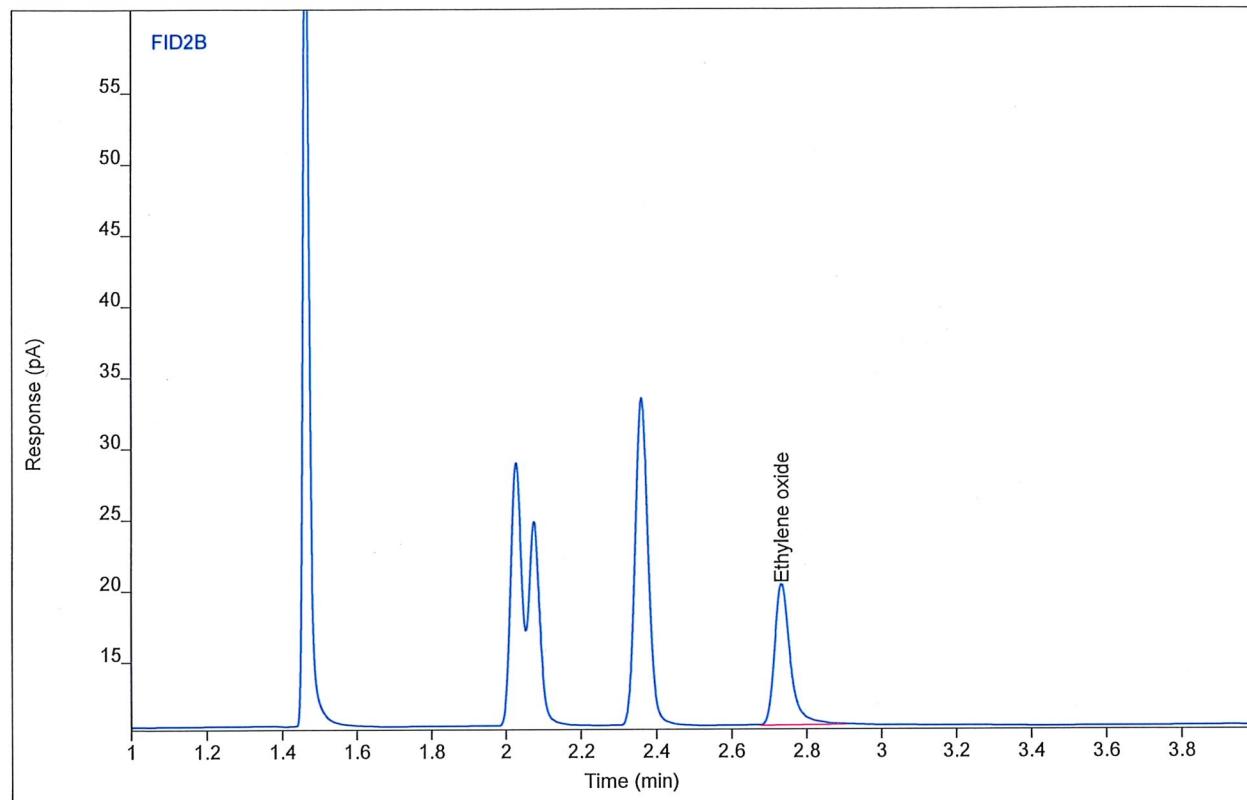
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 29.2172 | 10.0959 | 81.9941 | 1  | 81.9941 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B1303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 5:36 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Vial Number  
Vial 25  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 2/13/2019 6:09 AM  
Printed 2/15/2019 9:19 AM

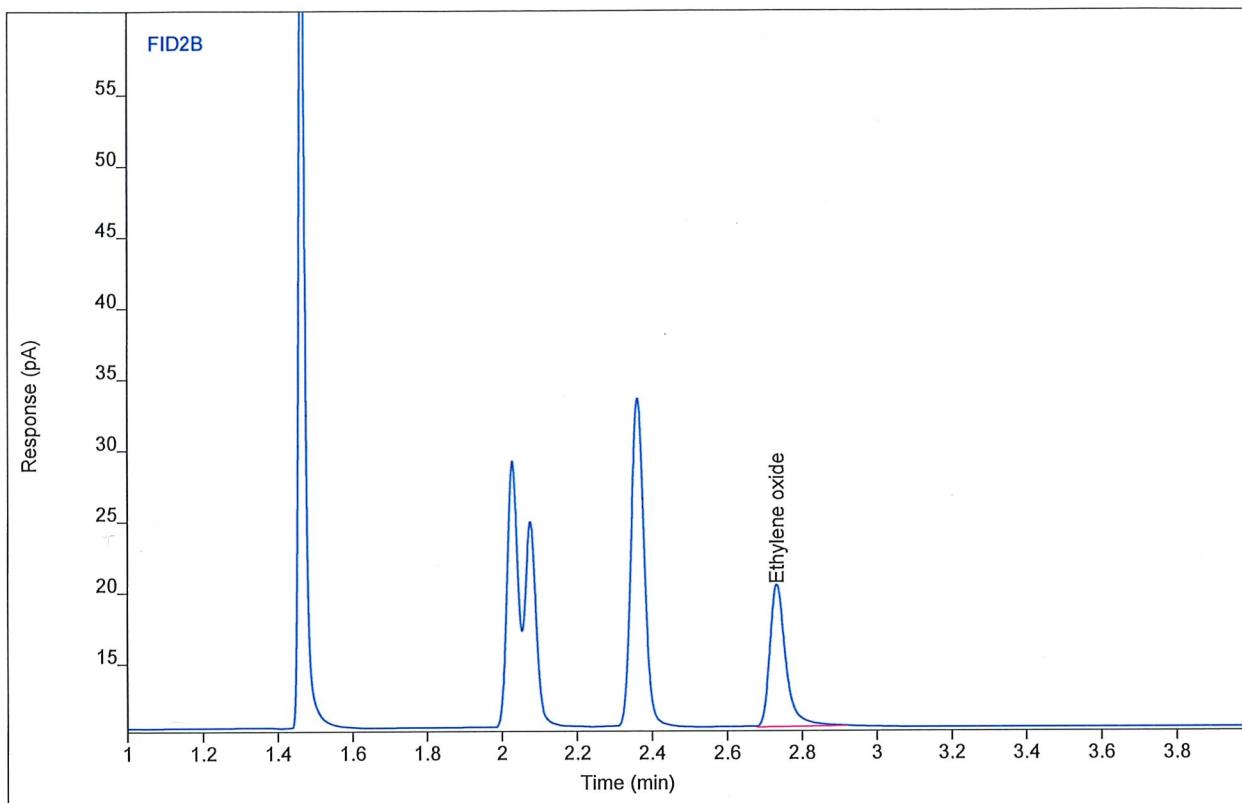


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 29.3818 | 9.96000 | 82.4512 | 1  | 82.4512 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                   |
|----------------|----------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration       |
| Sequence Name  | BETTYP1038 ver.4                 | Vial Number        | Vial 25           |
| Inj Data File  | 025B1304.D                       | Injection Volume   | 250               |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 4 of 4            |
| Injection Date | 2/13/2019 6:01 AM                | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/14/2019 11:55 AM               | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                            | Method Modified    | 2/13/2019 6:09 AM |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:19 AM |



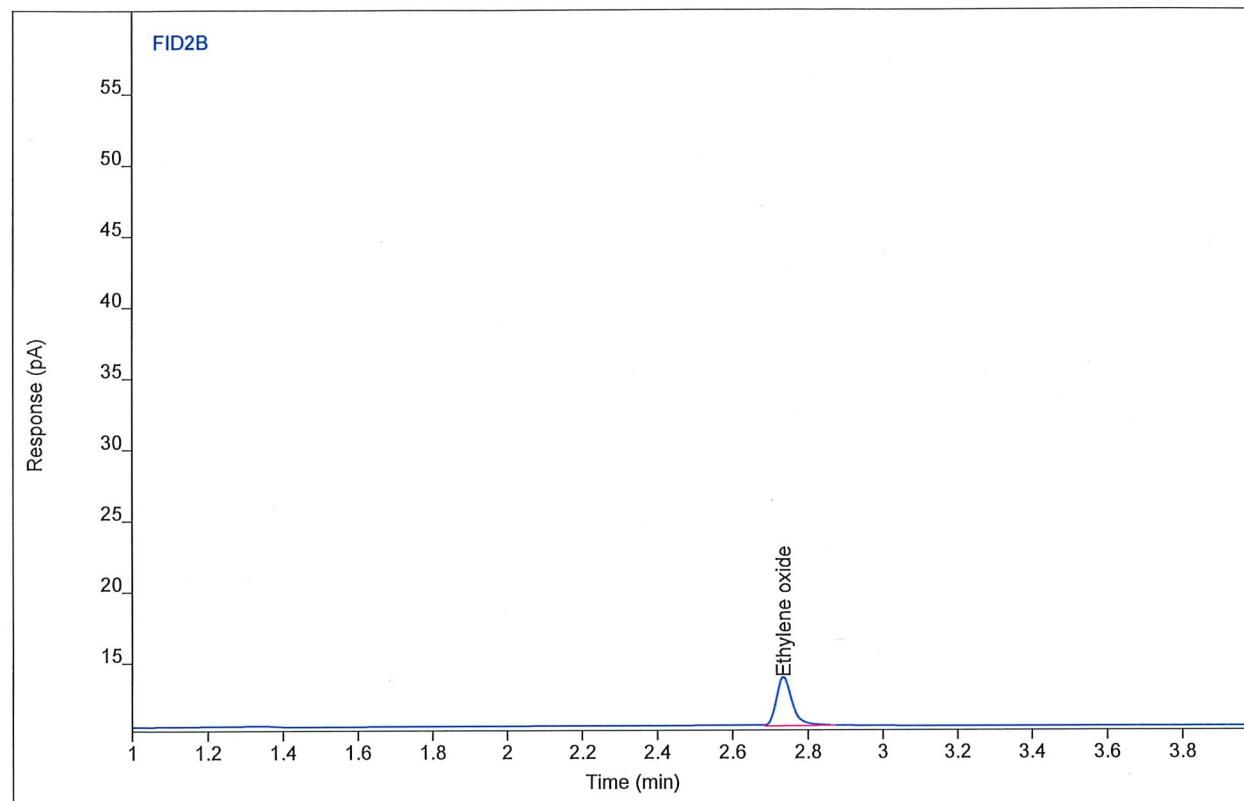
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 29.7875 | 10.0269 | 83.5775 | 1  | 83.5775 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.IN 3-1 BL SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 020B1401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 6:22 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 1 of 4  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



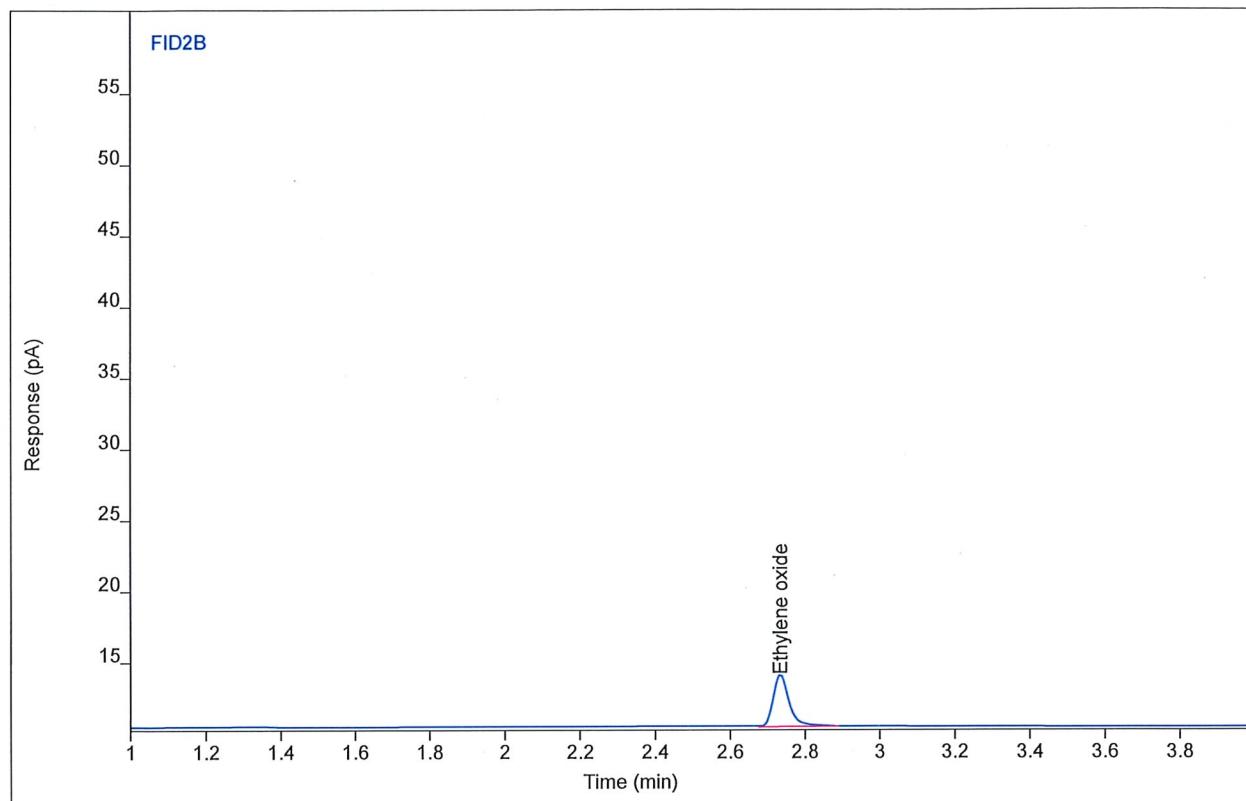
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.96698 | 3.43216 | 27.3651 | 21 | 574.667 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.IN 3-1 BL SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 020B1402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 6:29 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



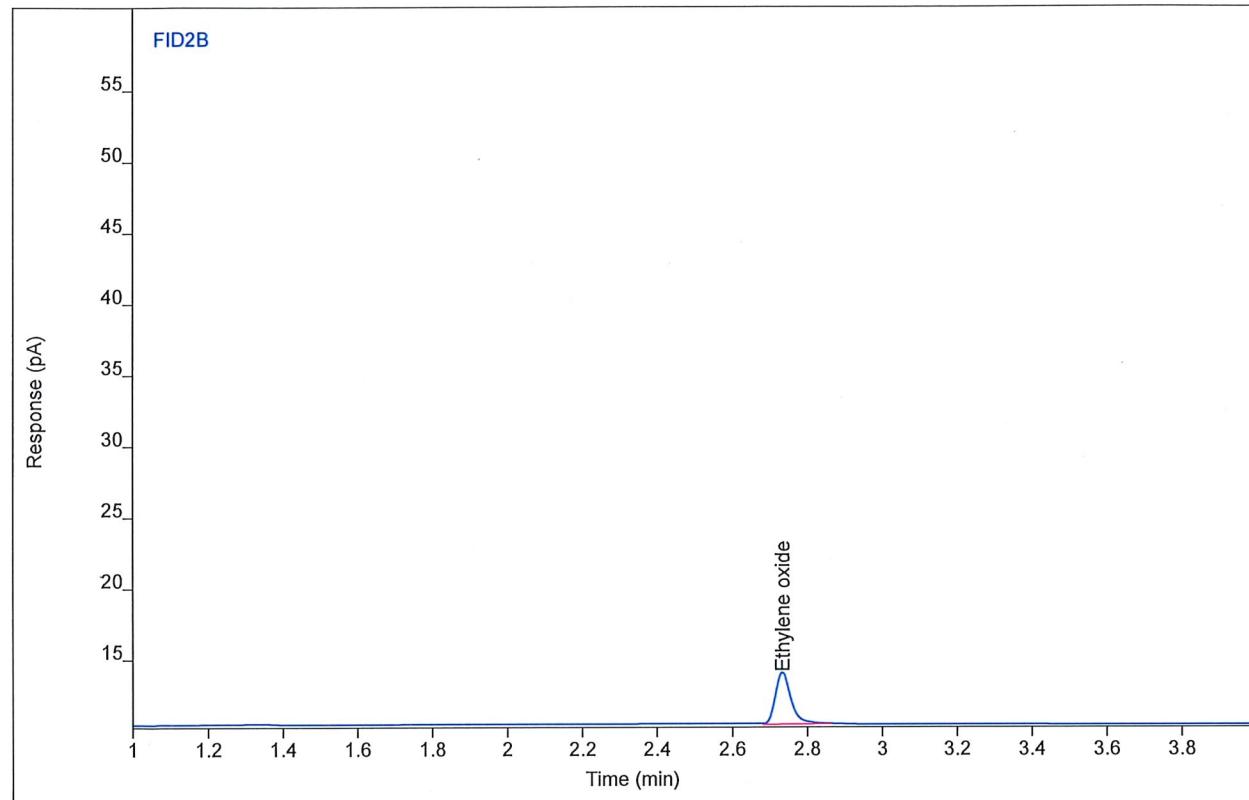
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 10.7019 | 3.64864 | 29.3333 | 21 | 616.000 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.IN 3-1 BL SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 020B1403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 6:37 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 20  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



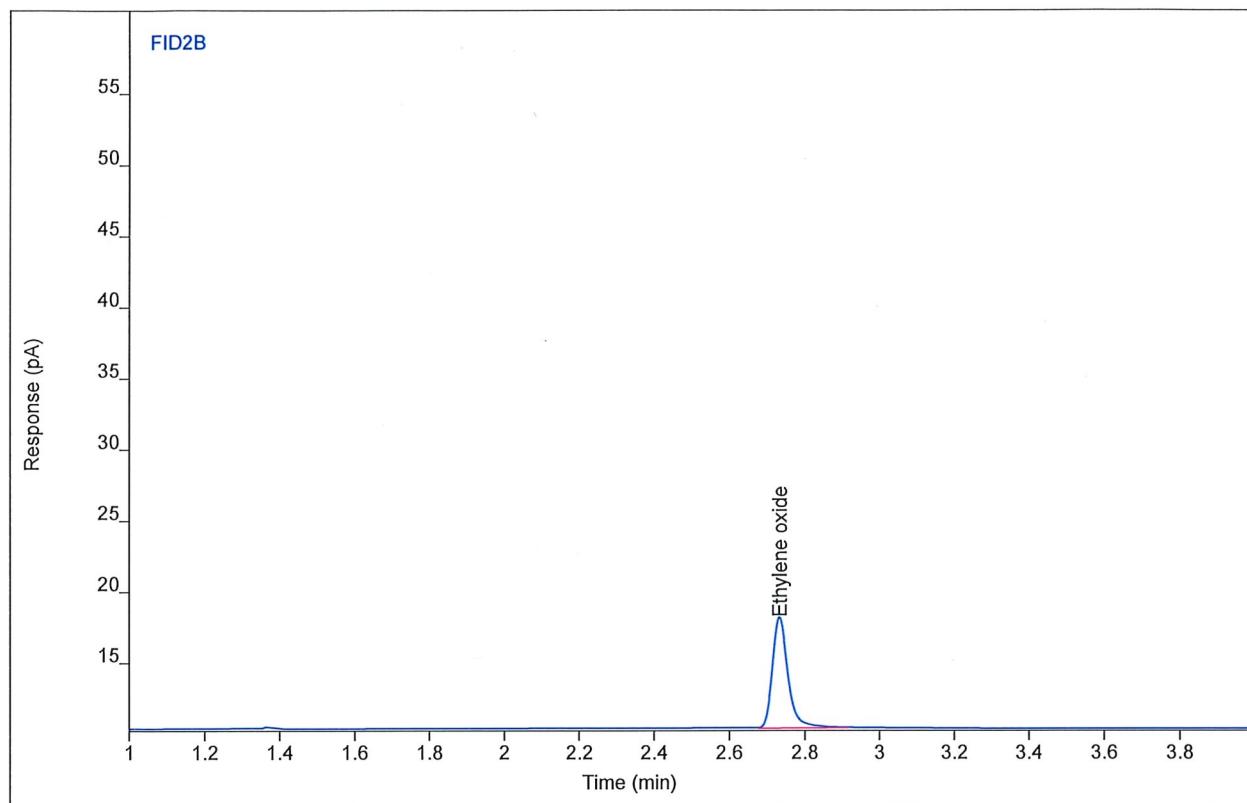
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.5445 | 3.67014 | 28.9119 | 21 | 607.149 | ppm  |

# Chromatogram Report

Sample Name 0219-044.IN 3-3 BL SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 019B1501.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 6:52 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 4  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



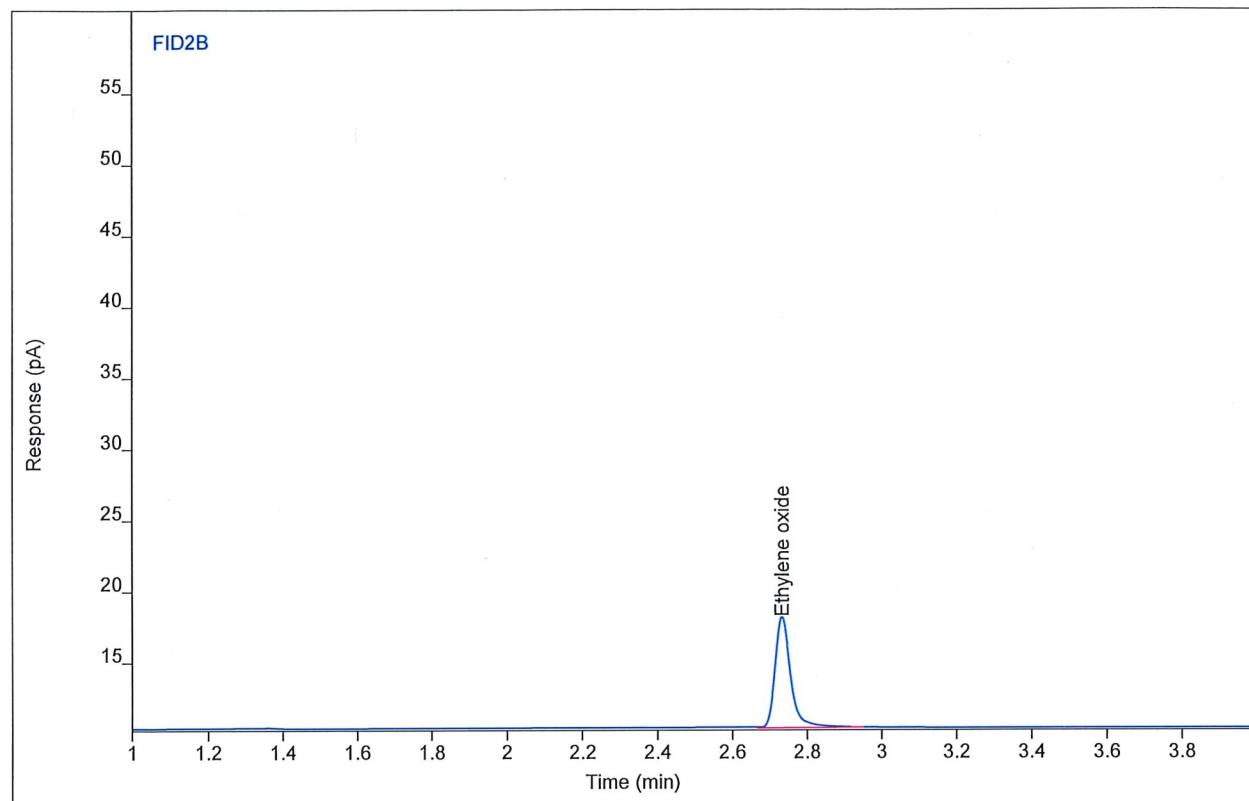
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 22.4701 | 7.80057 | 60.8498 | 21 | 1277.84 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.IN 3-3 BL SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 019B1502.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 7:00 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



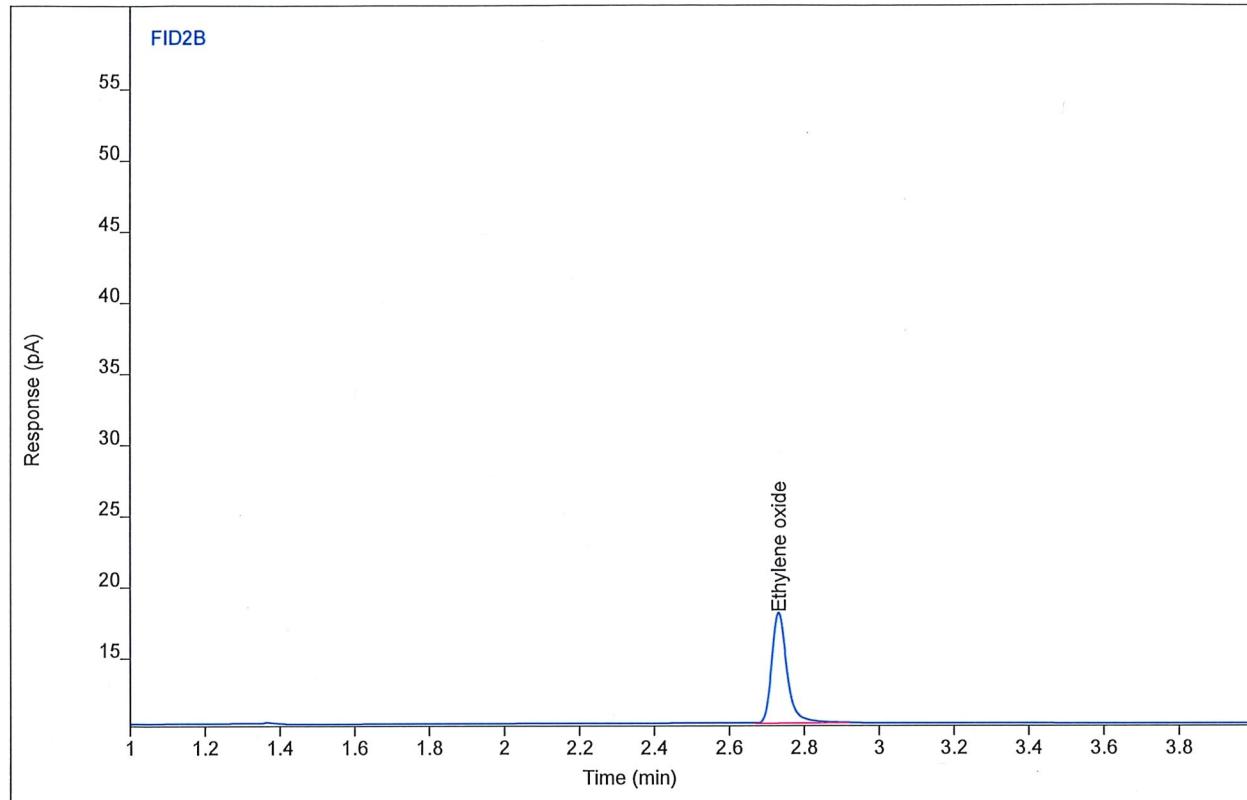
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 22.6988 | 7.79636 | 61.4622 | 21 | 1290.71 | ppm  |

# Chromatogram Report

Sample Name 0219-044.IN 3-3 BL SP.Bag  
Sequence Name BETTYP1038 ver.4  
Inj Data File 019B1503.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 7:07 AM  
File Modified 2/14/2019 11:55 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



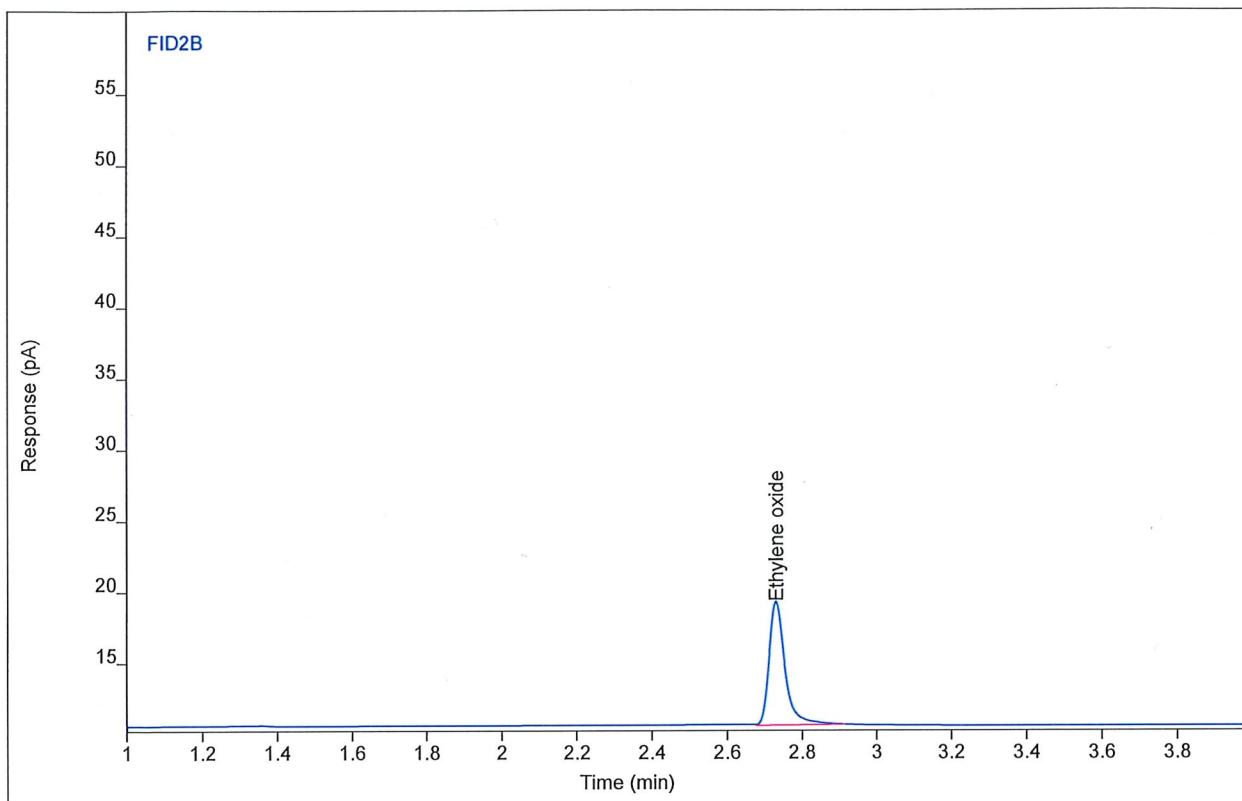
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 22.3652 | 7.78581 | 60.5687 | 21 | 1271.94 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-5 D BL SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B0401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 9:53 AM  
File Modified 2/14/2019 12:19 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



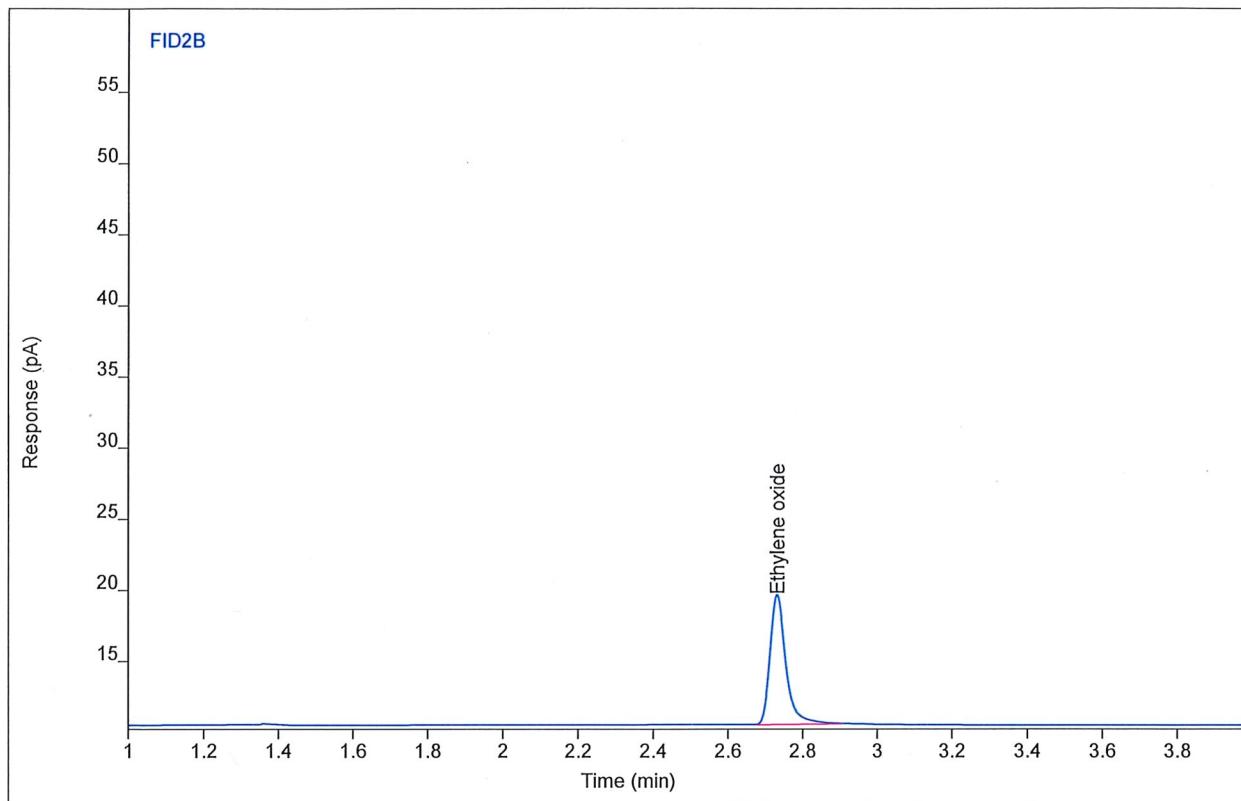
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 25.8633 | 8.69028 | 69.9371 | 21 | 1468.68 | ppm  |

# Chromatogram Report

Sample Name 0219-044.In 3-5 D BL SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B0402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 10:01 AM  
File Modified 2/14/2019 12:19 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



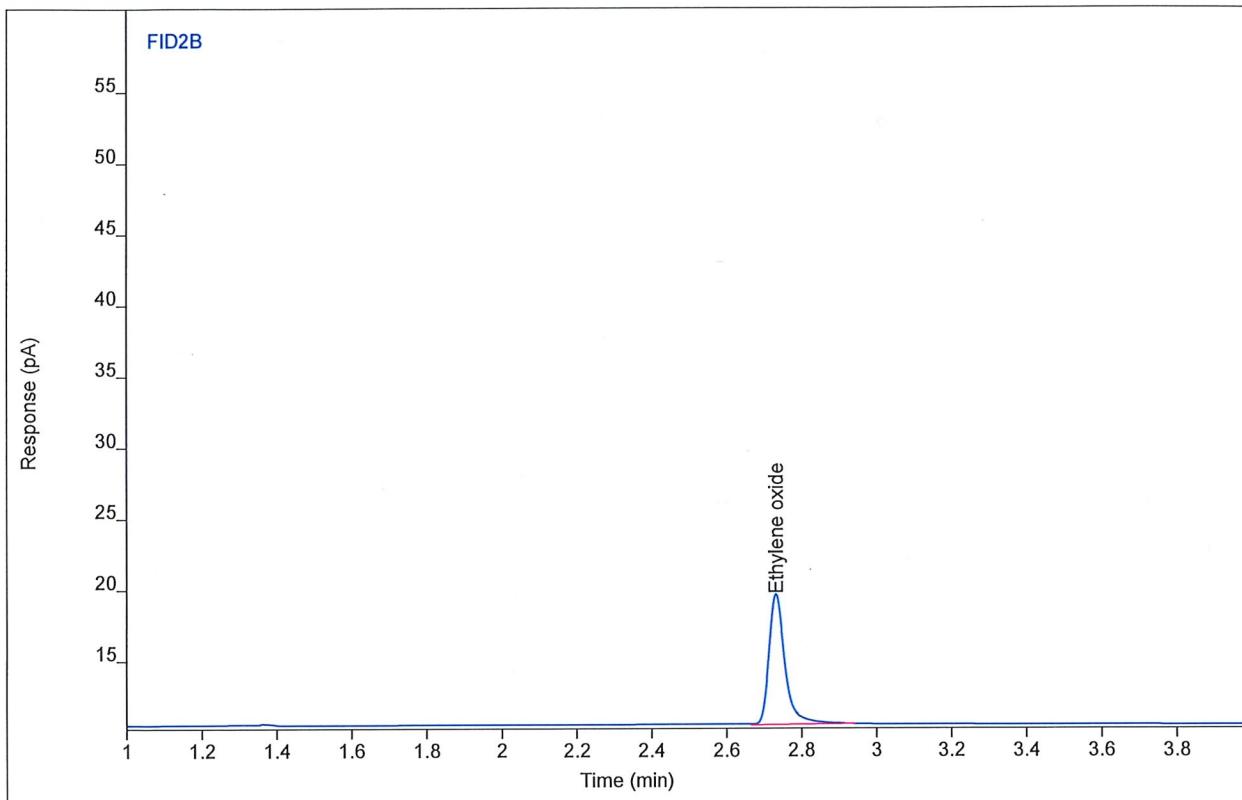
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 27.0070 | 9.13251 | 73.0001 | 21 | 1533.00 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.In 3-5 D BL SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B0403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 10:08 AM  
File Modified 2/14/2019 12:19 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



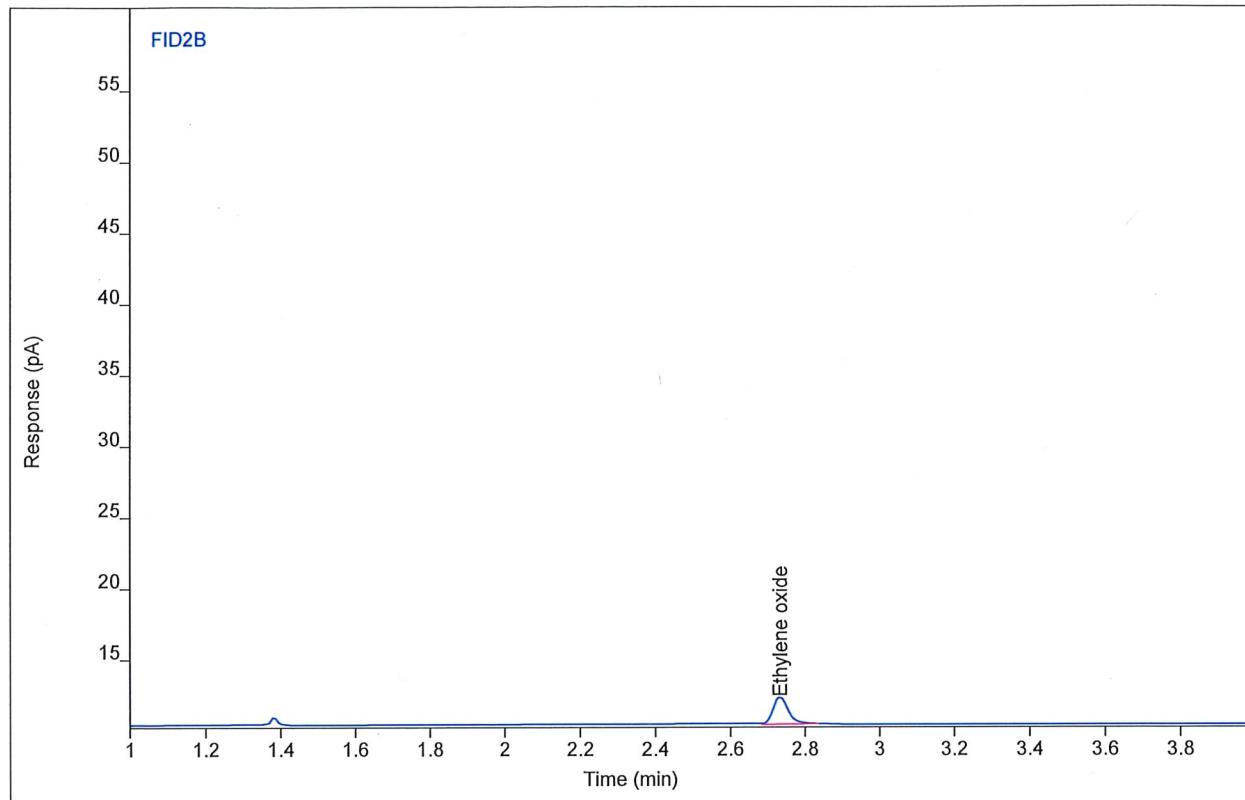
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 27.2027 | 9.17775 | 73.5241 | 21 | 1544.01 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 1-4 SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B0901.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 12:48 PM  
File Modified 2/14/2019 12:19 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



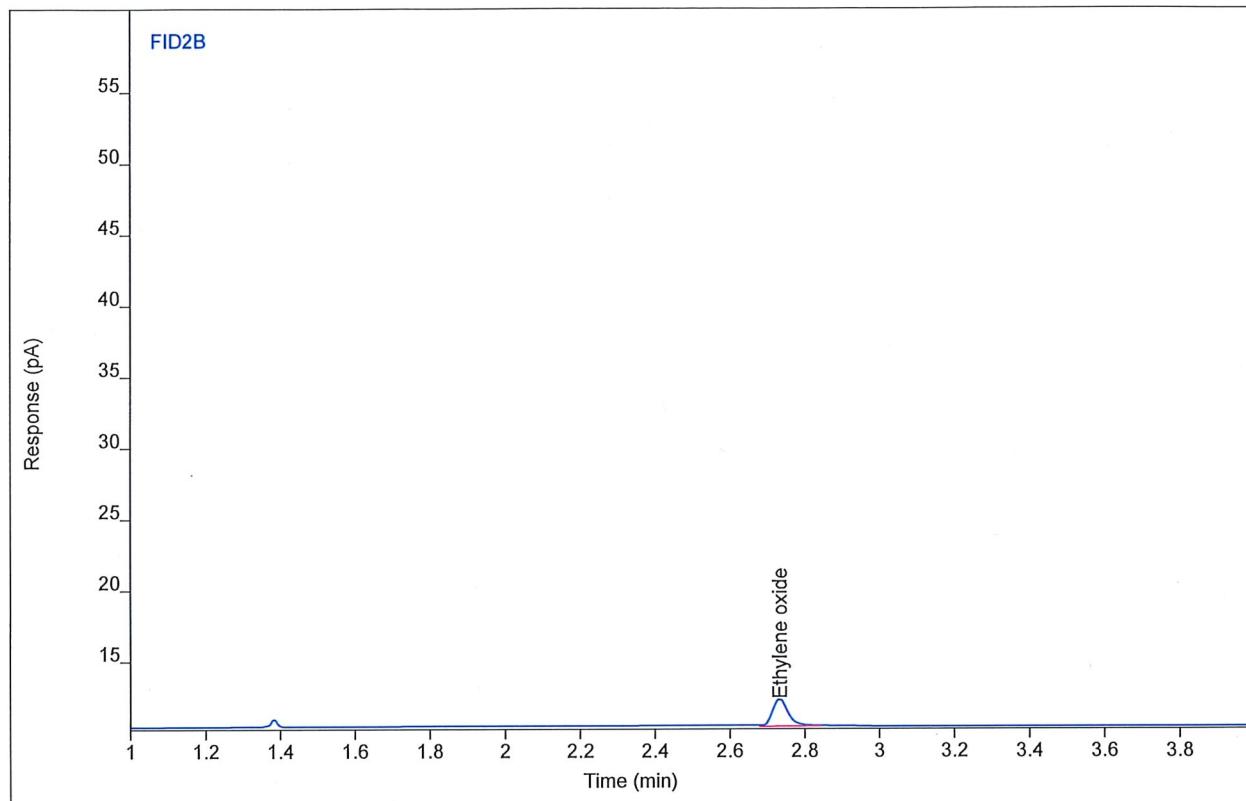
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.42863 | 1.91721 | 15.2109 | 1  | 15.2109 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 1-4 SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B0902.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 12:55 PM  
File Modified 2/14/2019 12:19 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



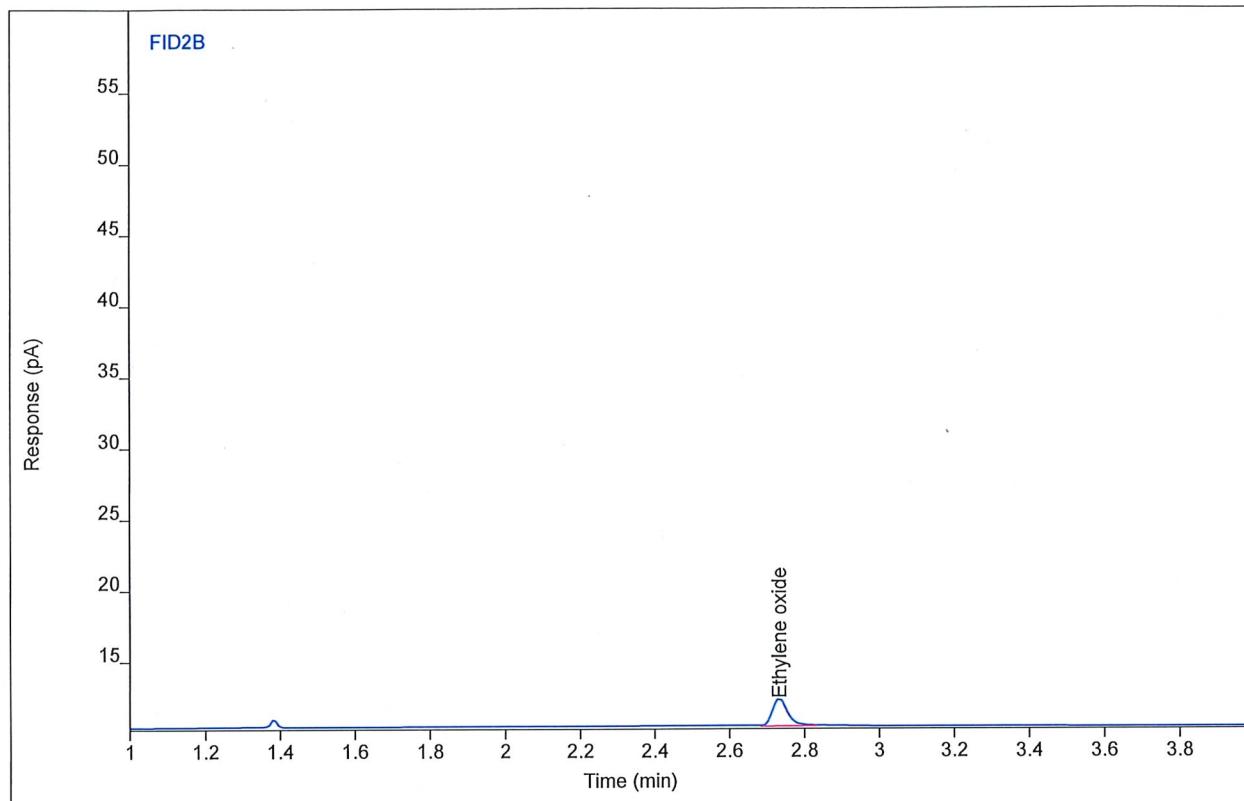
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.51080 | 1.90982 | 15.4309 | 1  | 15.4309 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 1-4 SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B0903.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 1:03 PM  
File Modified 2/14/2019 12:19 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL\_SHORT.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



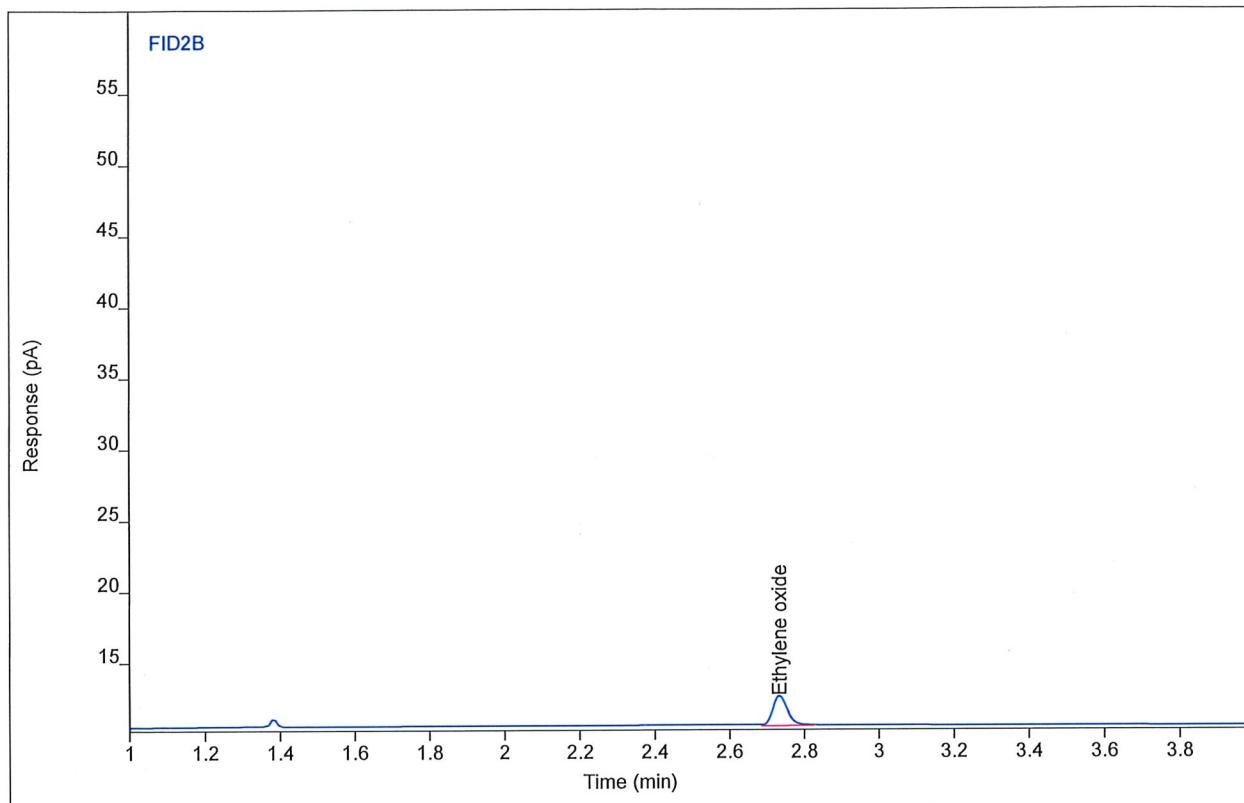
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.45479 | 1.92089 | 15.2810 | 1  | 15.2810 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 2-2 SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B1402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 4:57 PM  
File Modified 2/14/2019 12:20 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



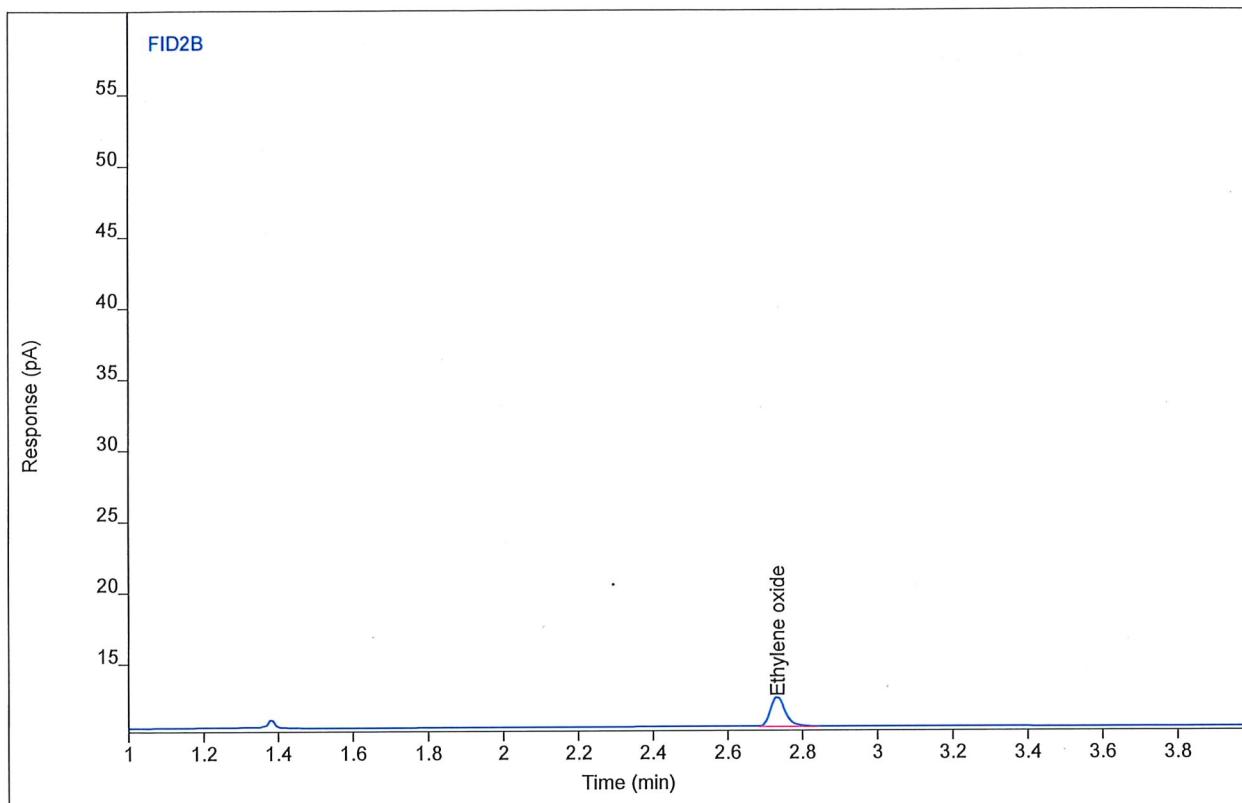
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.73597 | 2.10107 | 16.0340 | 1  | 16.0340 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name 0219-044.Out 2-2 SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B1403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 5:19 PM  
File Modified 2/14/2019 12:20 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



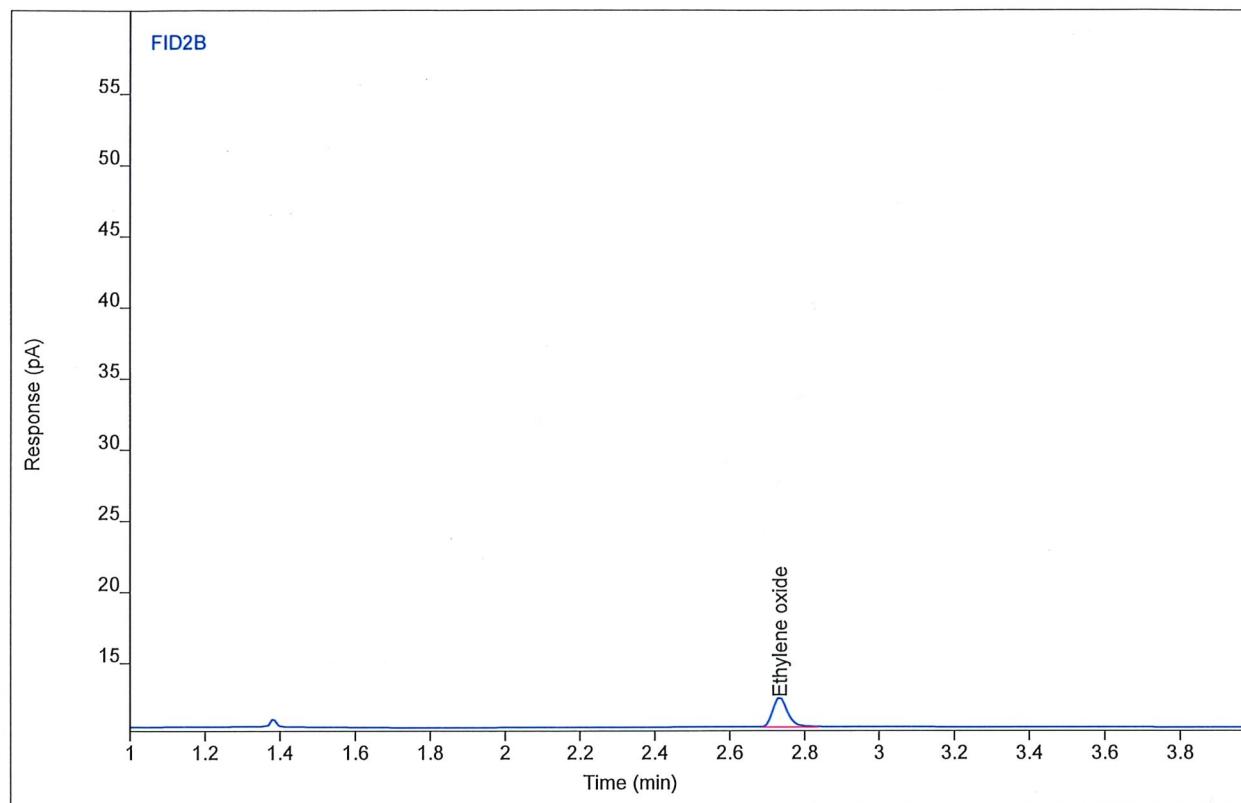
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.81094 | 2.09962 | 16.2348 | 1  | 16.2348 | ppm  |

# Chromatogram Report

Sample Name 0219-044.Out 2-2 SP.Bag  
Sequence Name BETTYP1040 ver.6  
Inj Data File 019B1404.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/13/2019 5:40 PM  
File Modified 2/14/2019 12:20 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Sample  
Vial Number Vial 19  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



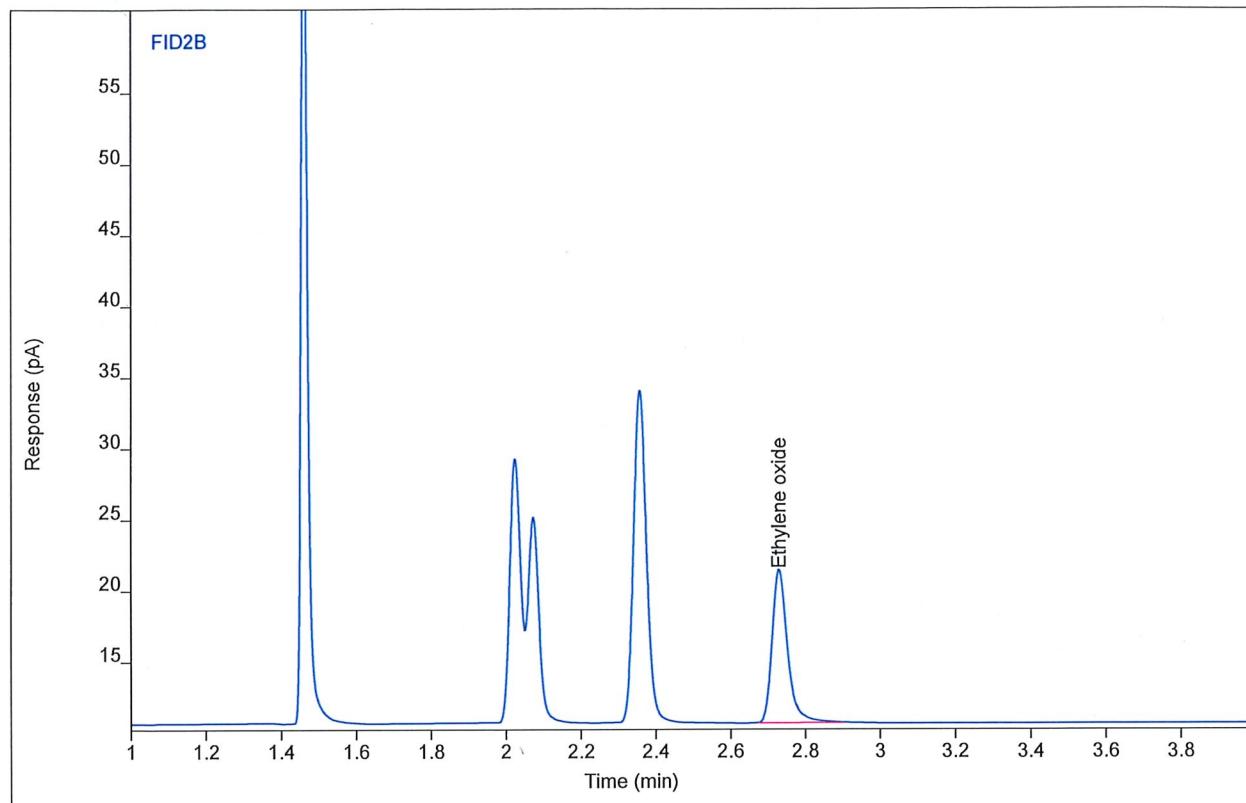
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 5.74984 | 2.08781 | 16.0711 | 1  | 16.0711 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1040 ver.6  
Inj Data File 025B1902.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 4:07 AM  
File Modified 2/14/2019 12:21 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM

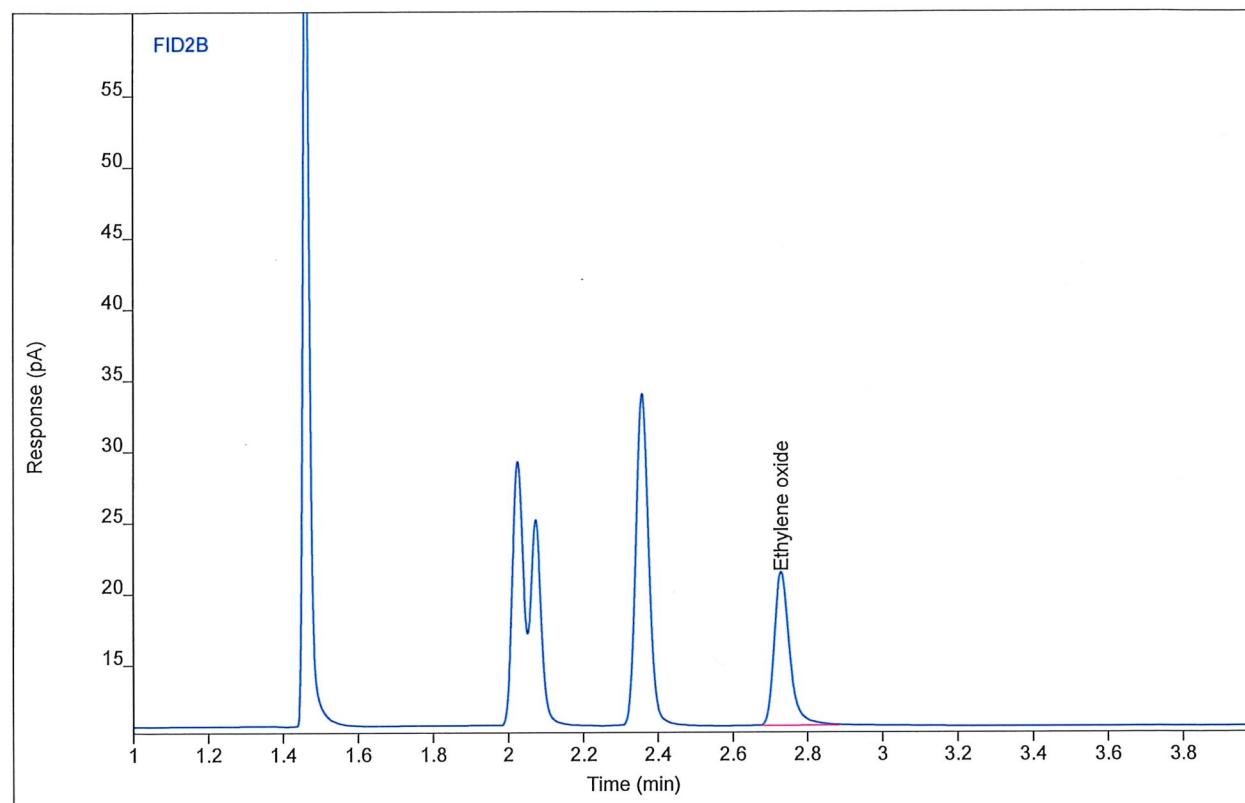


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 31.3463 | 10.8238 | 84.6211 | 1  | 84.6211 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                          |
|----------------|----------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration              |
| Sequence Name  | BETTYP1040 ver.6                 | Vial Number        | Vial 25                  |
| Inj Data File  | 025B1903.D                       | Injection Volume   | 250                      |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 3 of 4                   |
| Injection Date | 2/14/2019 4:32 AM                | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/14/2019 12:21 PM               | Analysis Method    | BETTYP1042_EO_AVG_1038.M |
| Instrument     | Betty                            | Method Modified    | 2/14/2019 11:51 AM       |
| Operator       | Justin Guenzler                  | Printed            | 2/15/2019 9:19 AM        |



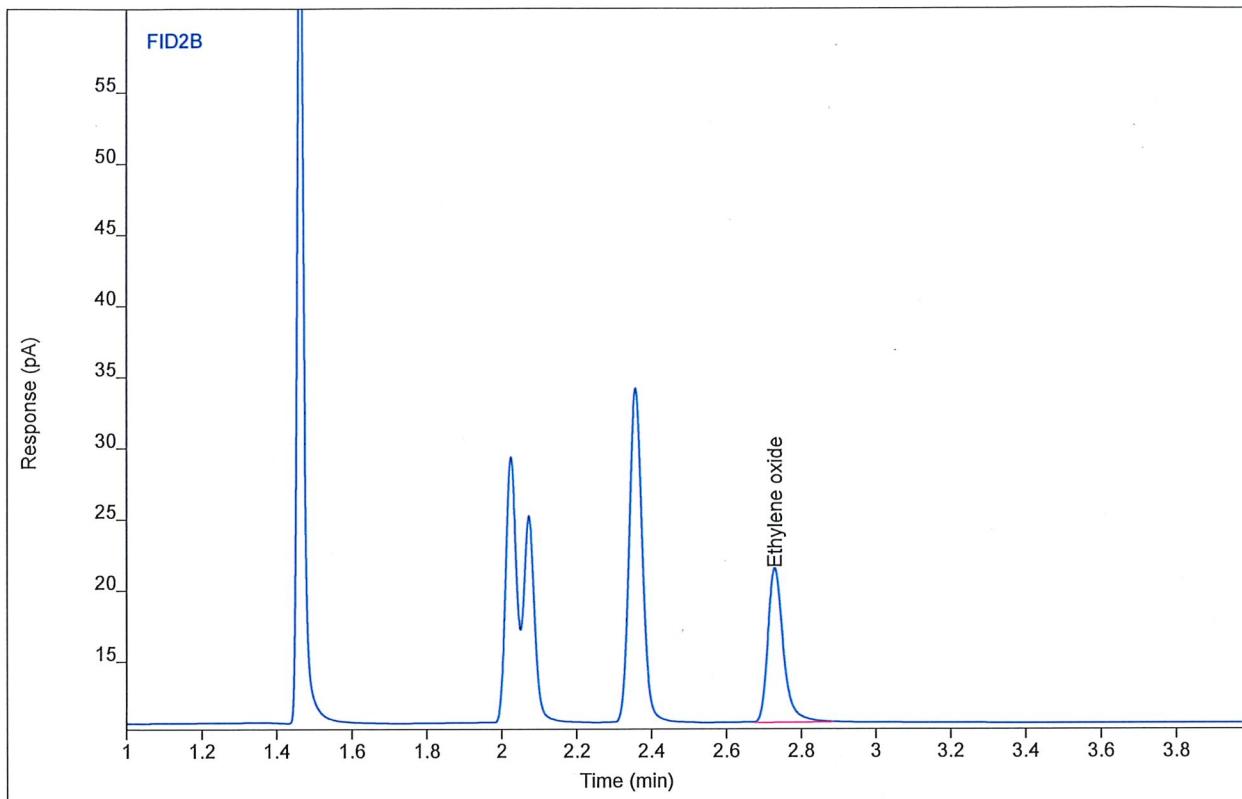
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 31.1021 | 10.8020 | 83.9673 | 1  | 83.9673 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1040 ver.6  
Inj Data File 025B1904.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 4:57 AM  
File Modified 2/14/2019 12:21 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/15/2019 9:19 AM



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 31.2504 | 10.8542 | 84.3643 | 1  | 84.3643 | ppm  |

**Enthalpy Analytical**

Company: Air Monitoring Specialists, Inc.

Job No.: 0219-044 - EPA Method 18 (Bags)

Client No.: Lifenet Health - Concert Drive

**Ethylene oxide -- Calibration Standards**

| SAMPLE NAME                     | Filename #1     | Filename #2     | Filename #3     | Analysis Method          | Ret Time (min) | Ret Time (min) | %dif RT | Conc # 1 | Conc # 2 | Conc # 3 | %dif conc | Units | Avg Conc | Standard Tag | % Tag |      |
|---------------------------------|-----------------|-----------------|-----------------|--------------------------|----------------|----------------|---------|----------|----------|----------|-----------|-------|----------|--------------|-------|------|
| BettyP1029#SC3 ENV(1=636.6=400) | 025B0101.D      | 025B0102.D      | 025B0103.D      | BETTYP957_E.O.M          | 2.73           | 2.73           | 0.0     | 75.8     | 76.7     | 76.9     | 0.8       | ppm   | 76.5     | 78.8         | 97.1  |      |
| BettyP1029#SC3 ENV(1=636.6=400) | 025B1701.D      | 025B1702.D      | 025B1703.D      | BETTYP957_E.O.M          | 2.74           | 2.73           | 2.74    | 0.0      | 75.3     | 73.3     | 73.5      | 1.7   | ppm      | 74.1         | 78.8  | 94.0 |
| BettyP1029#SC3 ENV(1=636.6=400) | 025B1601.D      | 025B1602.D      | 025B1603.D      | BETTYP957_E.O.M          | 2.73           | 2.74           | 2.74    | 0.0      | 75.5     | 74.0     | 73.5      | 1.5   | ppm      | 74.3         | 78.8  | 94.4 |
| BettyP374 Method Blank 1 #MB    | 017B2001.D      | 017B2002.D      | 017B2003.D      | BETTYP957_E.O.M          | NA             | NA             | NA      | 0.485    | 0.485    | 0.485    | 0         | ppm   | 0.485    | ND           |       |      |
| BettyP1029#SC3 ENV(1=636.6=400) | 025B0103.D      | 025B0104.D      | 025B0104.D      | BETTYP957_E.O.M          | 2.73           | 2.74           | 2.73    | 0.0      | 69.1     | 71.6     | 72.9      | 2.9   | ppm      | 71.2         | 78.8  | 90.4 |
| BettyP1029#SC3 ENV(1=636.6=400) | _030_025B2302.D | _031_025B2303.D | _032_025B2304.D | BETTYP1038_EO_COMBINED.M | 2.73           | 2.73           | 2.73    | 0.0      | 83.0     | 82.8     | 82.6      | 0.3   | ppm      | 82.8         | 78.8  | 105  |
| BettyP1029#SC3 ENV(1=636.6=400) | 025B1302.D      | 025B1303.D      | 025B1304.D      | BETTYP1038_EO_COMBINED.M | 2.73           | 2.73           | 2.73    | 0.0      | 73.6     | 73.8     | 74.0      | 0.3   | ppm      | 73.8         | 78.8  | 93.7 |
| BettyP1029#SC3 ENV(1=636.6=400) | 025B1303.D      | 025B1304.D      | 025B1304.D      | BETTYP1038_EO.M          | 2.73           | 2.73           | 2.73    | 0.0      | 82.0     | 82.5     | 83.6      | 1.1   | ppm      | 82.7         | 78.8  | 105  |
| BettyP1029#SC3 ENV(1=636.6=400) | 025B1902.D      | 025B1903.D      | 025B1904.D      | BETTYP1042_EO_AVG_1038.M | 2.73           | 2.73           | 2.73    | 0.0      | 84.6     | 84.0     | 84.4      | 0.4   | ppm      | 84.3         | 78.8  | 107  |

=====

Calibration Table

=====

Calib. Data Modified : 2/14/2019 11:47:34 AM

Rel. Reference Window : 1.000 %  
Abs. Reference Window : 0.000 min  
Rel. Non-ref. Window : 1.000 %  
Abs. Non-ref. Window : 0.000 min  
Uncalibrated Peaks : using compound Ethylene oxide  
Partial Calibration : Yes, identified peaks are recalibrated  
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear  
Origin : Connected  
Weight : Quadratic (Amnt)

Recalibration Settings:  
Average Response : Average all calibrations  
Average Retention Time: Floating Average New 75%

Calibration Report Options :  
Printout of recalibrations within a sequence:  
    Calibration Table after Recalibration  
    Normal Report after Recalibration  
If the sequence is done with bracketing:  
    Results of first cycle (ending previous bracket)

Signal 1: FID2 B,

| RetTime<br>[min] | Lvl<br>Sig | Amount<br>[ppm] | Area     | Amt/Area | Ref Grp | Name           |
|------------------|------------|-----------------|----------|----------|---------|----------------|
| 2.738            | 1          | 5.12000         | 1.79174  | 2.85756  |         | Ethylene oxide |
|                  | 2          | 25.60000        | 9.77407  | 2.61917  |         |                |
|                  | 3          | 78.77000        | 30.85963 | 2.55253  |         |                |
|                  | 4          | 256.00000       | 96.44357 | 2.65440  |         |                |

More compound-specific settings:

Compound: Ethylene oxide  
Time Window : From 2.691 min To 2.757 min

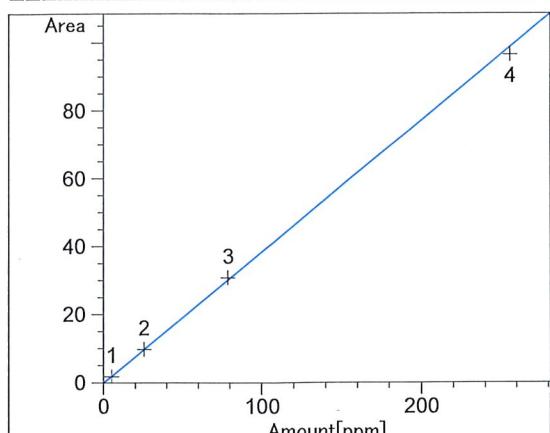
=====  
Peak Sum Table  
=====

\*\*\*No Entries in table\*\*\*

=====

Calibration Curves

=====



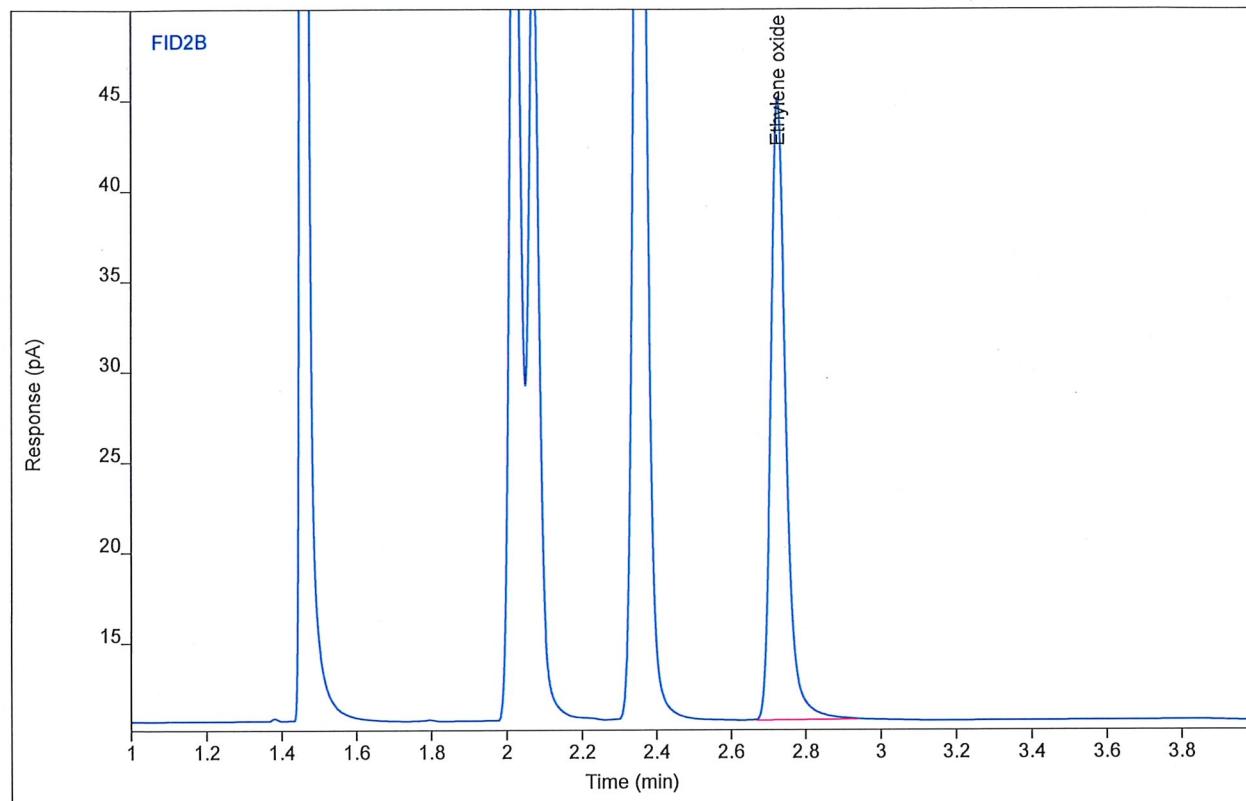
Ethylene oxide at exp. RT: 2.738  
FID2 B,  
Correlation: 0.99980  
Residual Std. Dev.: 1.70515  
Formula:  $y = mx + b$   
 $m: 3.86577e-1$   
 $b: -1.83523e-1$   
x: Amount  
y: Area  
Calibration Level Weights:  
Level 1 : 1  
Level 2 : 0.04  
Level 3 : 0.004225  
Level 4 : 0.0004

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0201.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 7:00 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



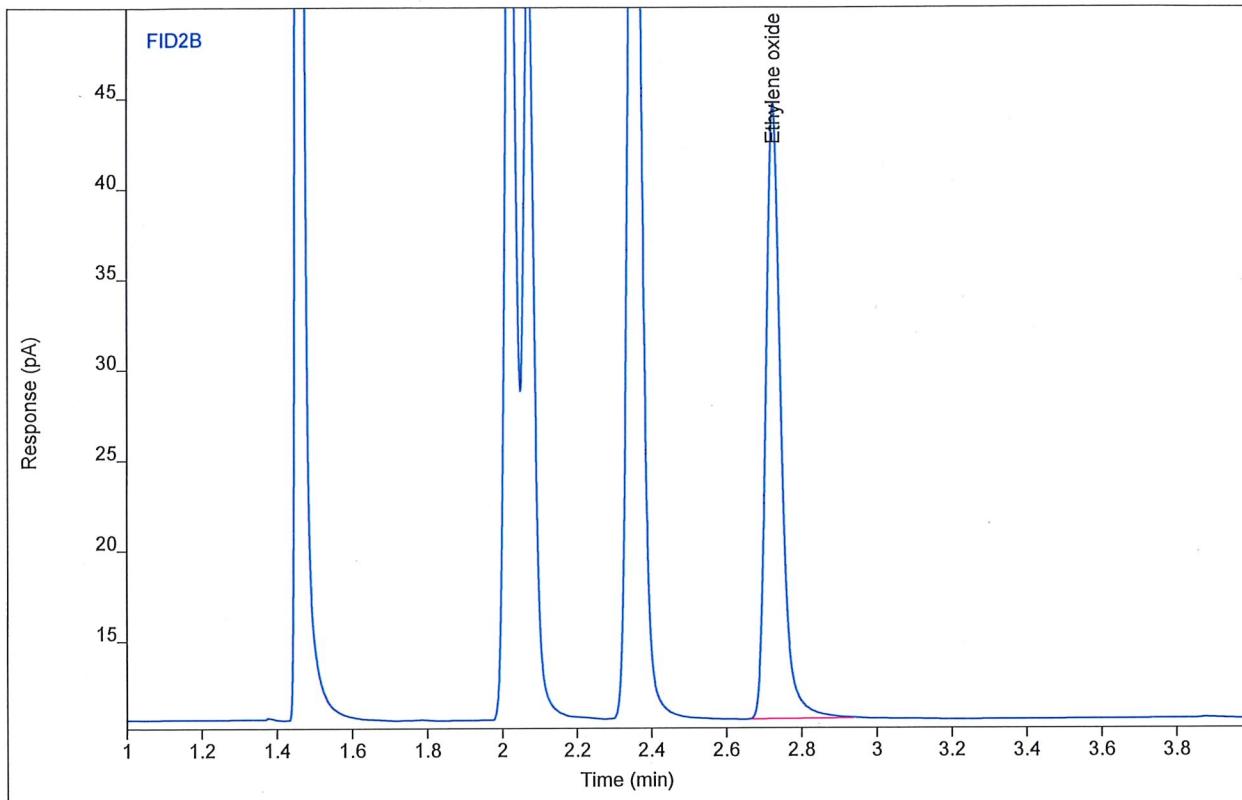
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 96.9863 | 34.4293 | 251.359 | 1  | 251.359 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0202.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 7:24 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



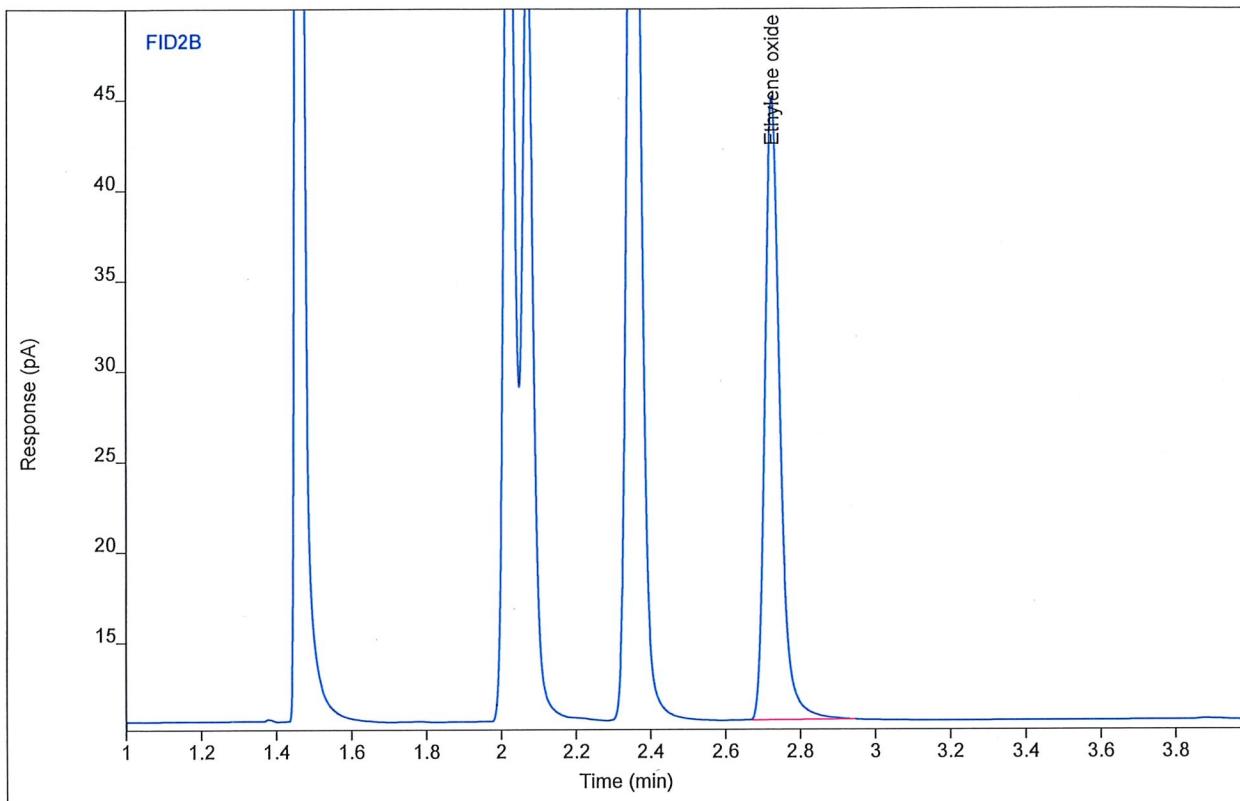
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 95.6208 | 34.0494 | 247.827 | 1  | 247.827 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0203.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 7:49 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Vial Number  
Calibration Vial 25  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



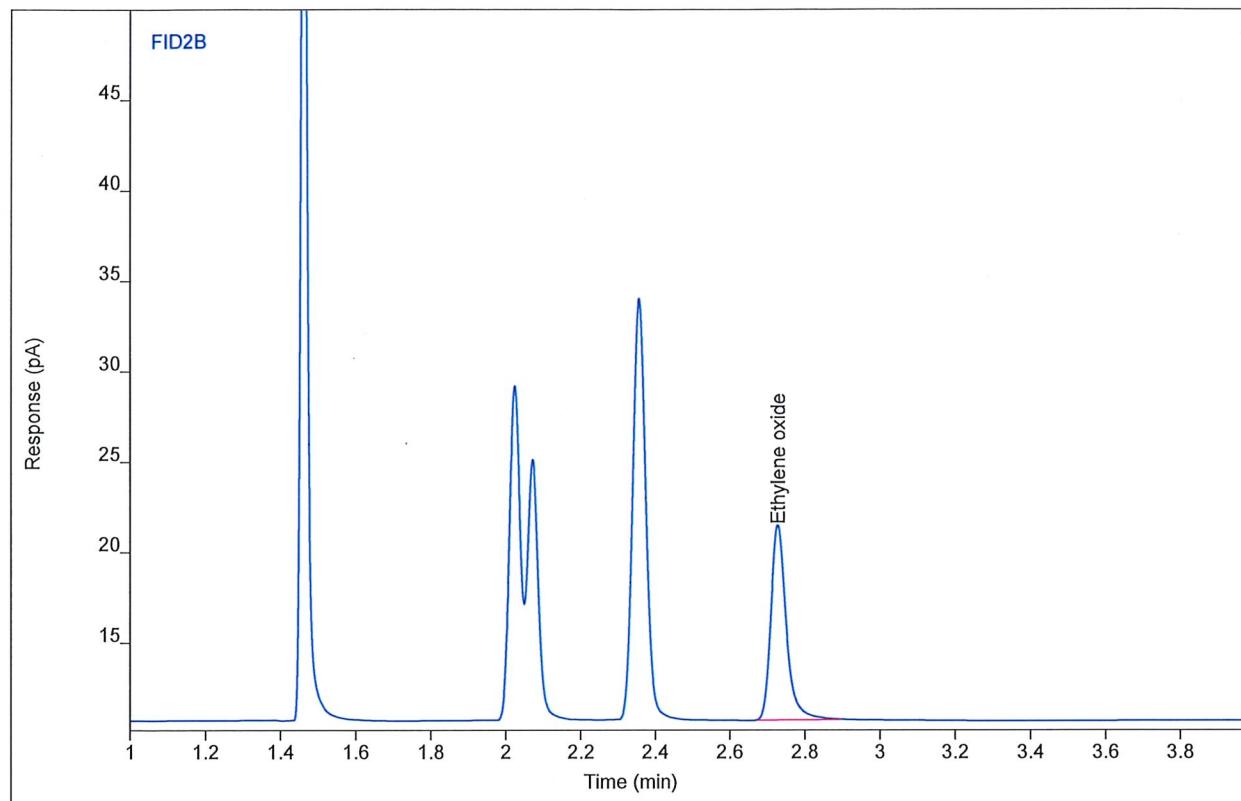
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 96.7236 | 34.4782 | 250.680 | 1  | 250.680 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0301.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 8:13 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



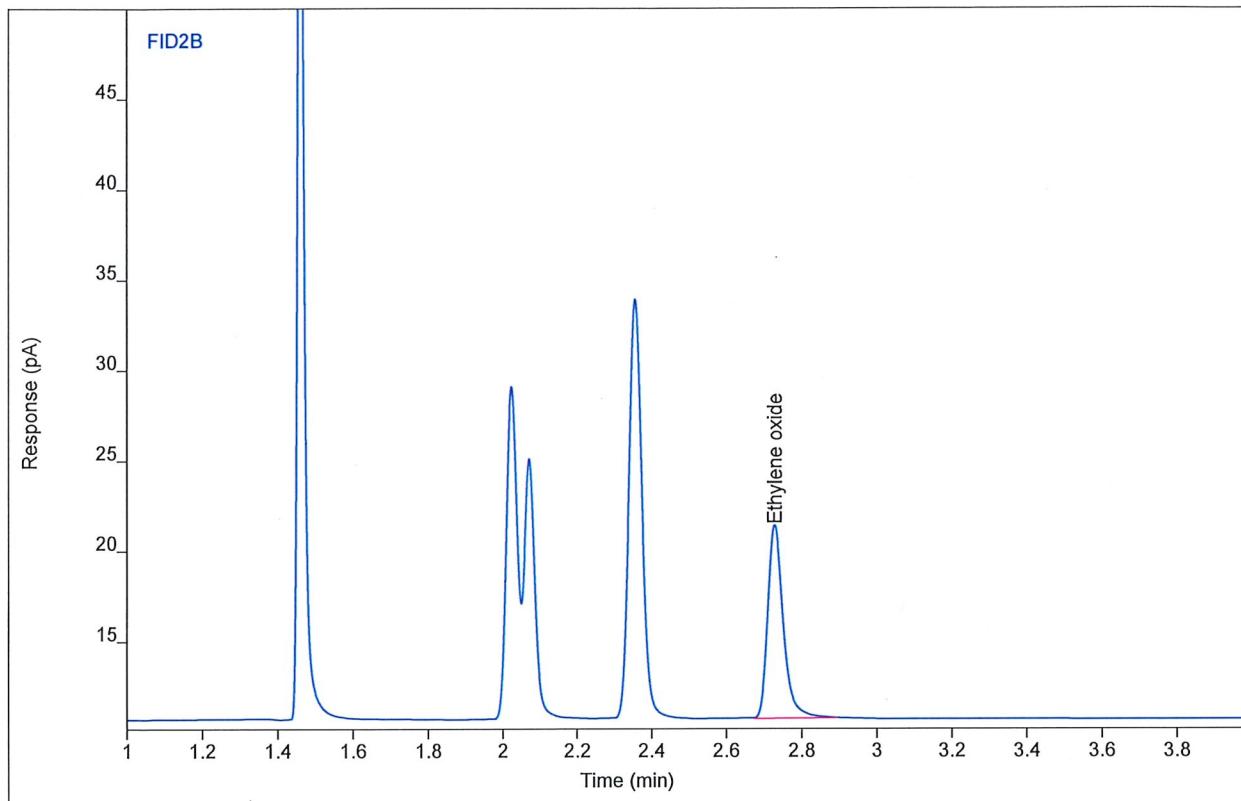
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 31.0879 | 10.8264 | 80.8931 | 1  | 80.8931 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 8:38 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



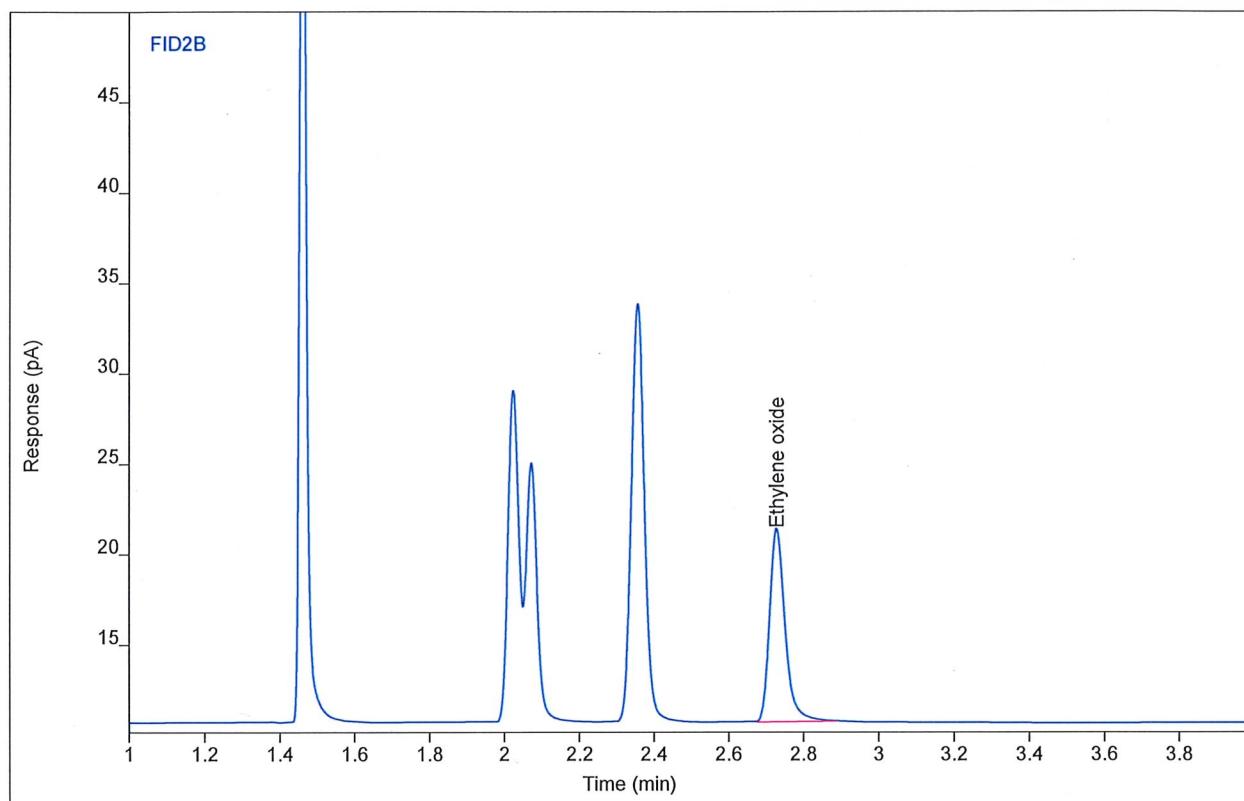
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 30.7244 | 10.7262 | 79.9529 | 1  | 79.9529 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 9:03 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



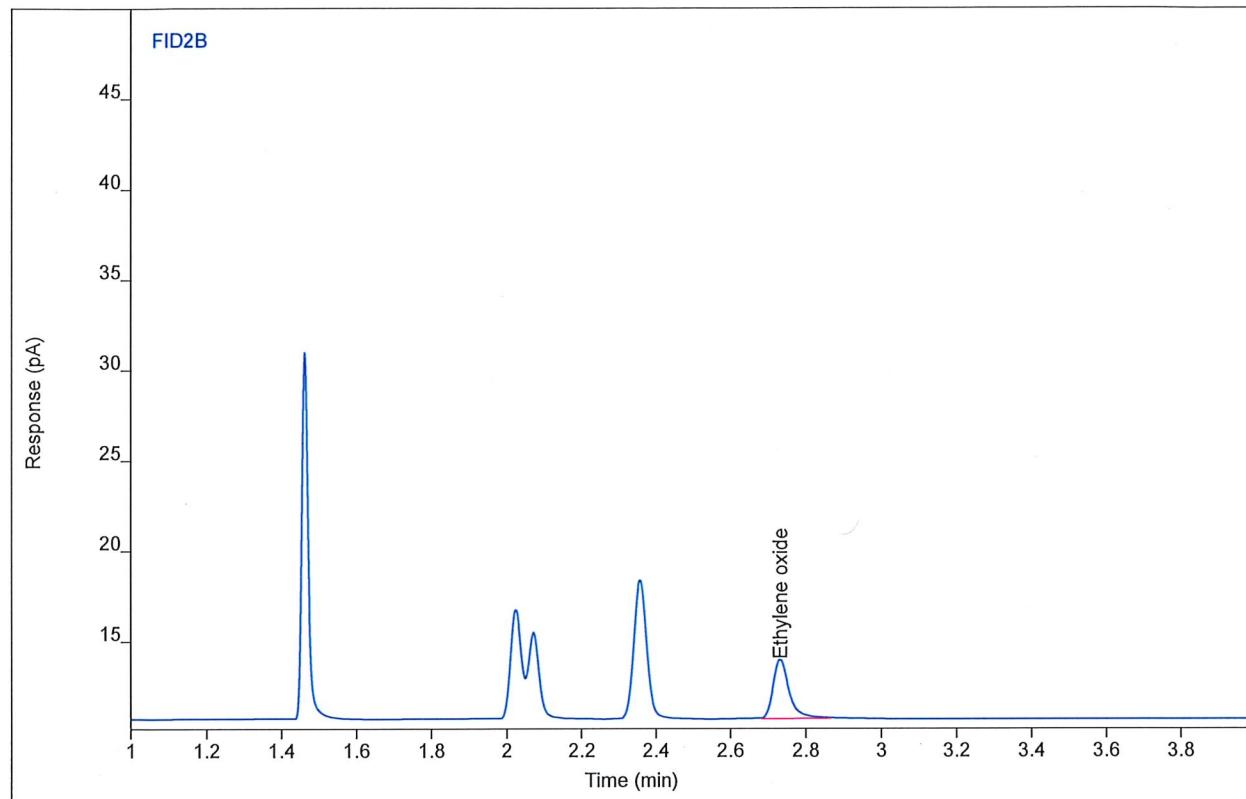
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 30.7665 | 10.7125 | 80.0616 | 1  | 80.0616 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 9:27 AM  
File Modified 2/14/2019 12:43 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



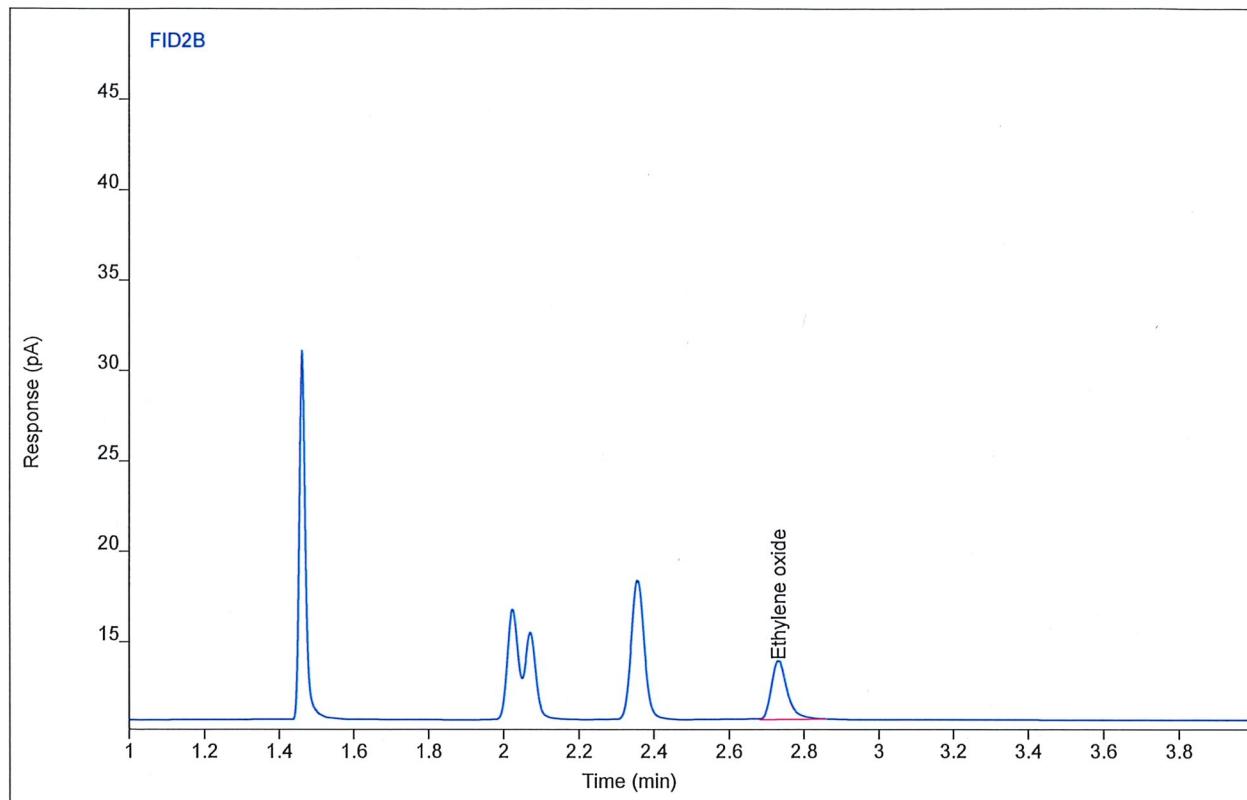
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.68032 | 3.28394 | 25.5158 | 1  | 25.5158 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 9:52 AM  
File Modified 2/14/2019 12:44 PM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



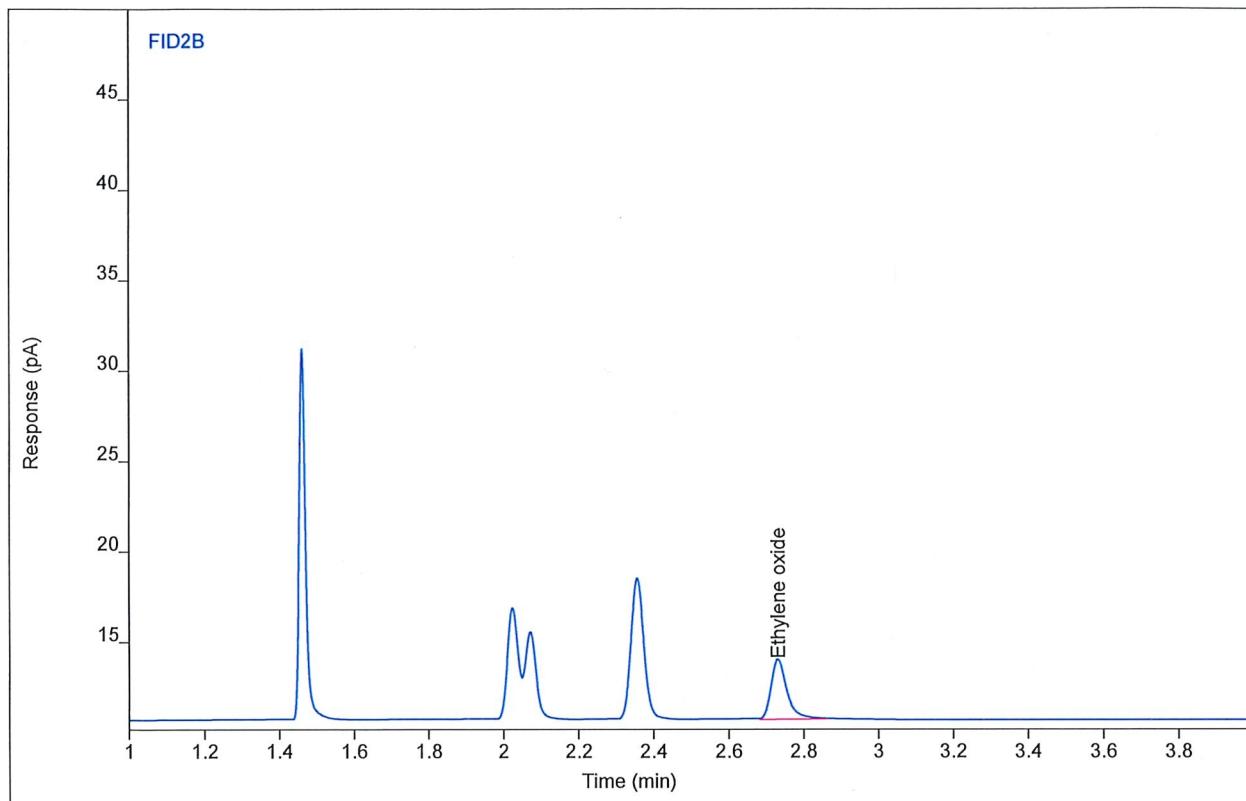
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.74881 | 3.30236 | 25.6930 | 1  | 25.6930 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 10:16 AM  
File Modified 2/14/2019 12:44 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM



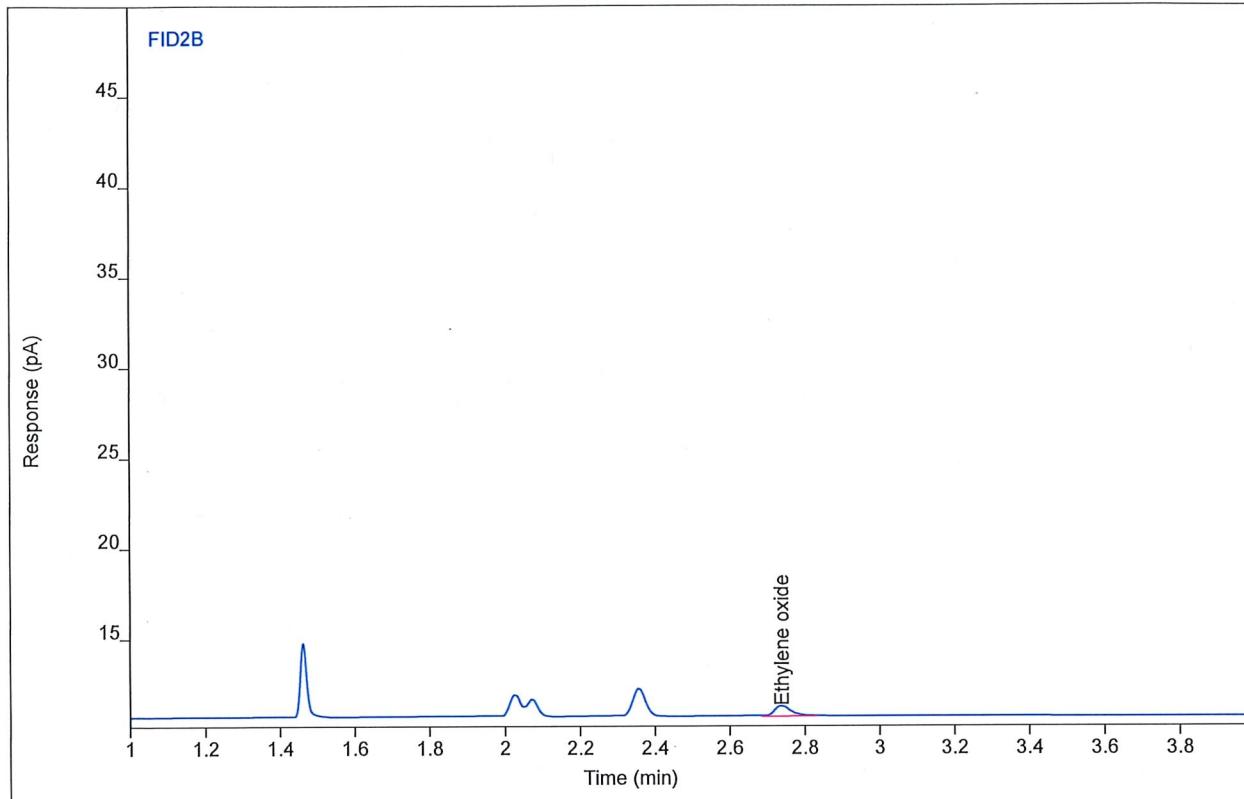
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.89309 | 3.35093 | 26.0662 | 1  | 26.0662 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BETTYP1042 ver.3  
Inj Data File 025B0501.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 10:41 AM  
File Modified 2/14/2019 12:44 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO.M  
Method Modified 2/14/2019 11:47 AM  
Printed 2/14/2019 12:53 PM

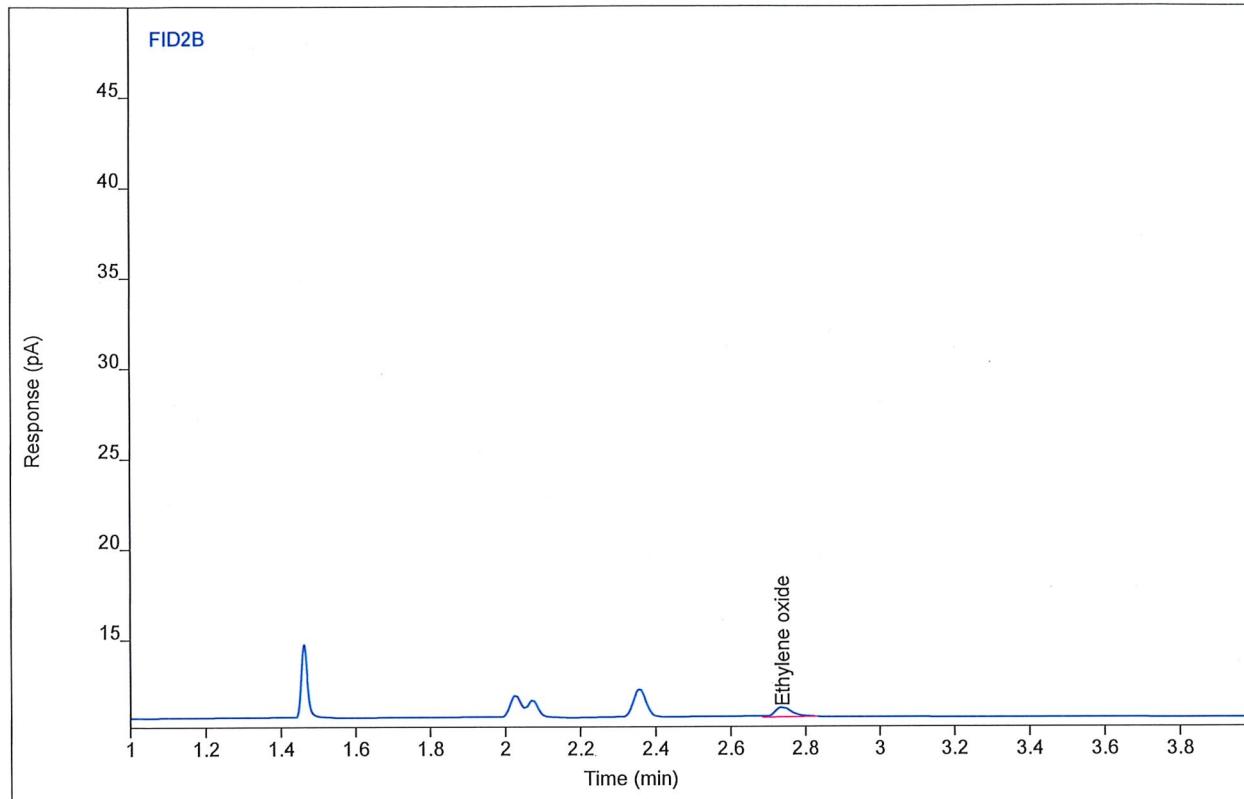


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.78751 | 0.58006 | 5.09649 | 1  | 5.09649 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration        |
| Sequence Name  | BETTYP1042 ver.3                     | Vial Number        | Vial 25            |
| Inj Data File  | 025B0502.D                           | Injection Volume   | 250                |
| File Location  | GC/2019/Betty/Quarter 1              | Injection          | 2 of 3             |
| Injection Date | 2/14/2019 11:06 AM                   | Acquisition Method | GC142P133_CAL.M    |
| File Modified  | 2/14/2019 12:44 PM                   | Analysis Method    | BETTYP1042_EO.M    |
| Instrument     | Betty                                | Method Modified    | 2/14/2019 11:47 AM |
| Operator       | Justin Guenzler                      | Printed            | 2/14/2019 12:53 PM |

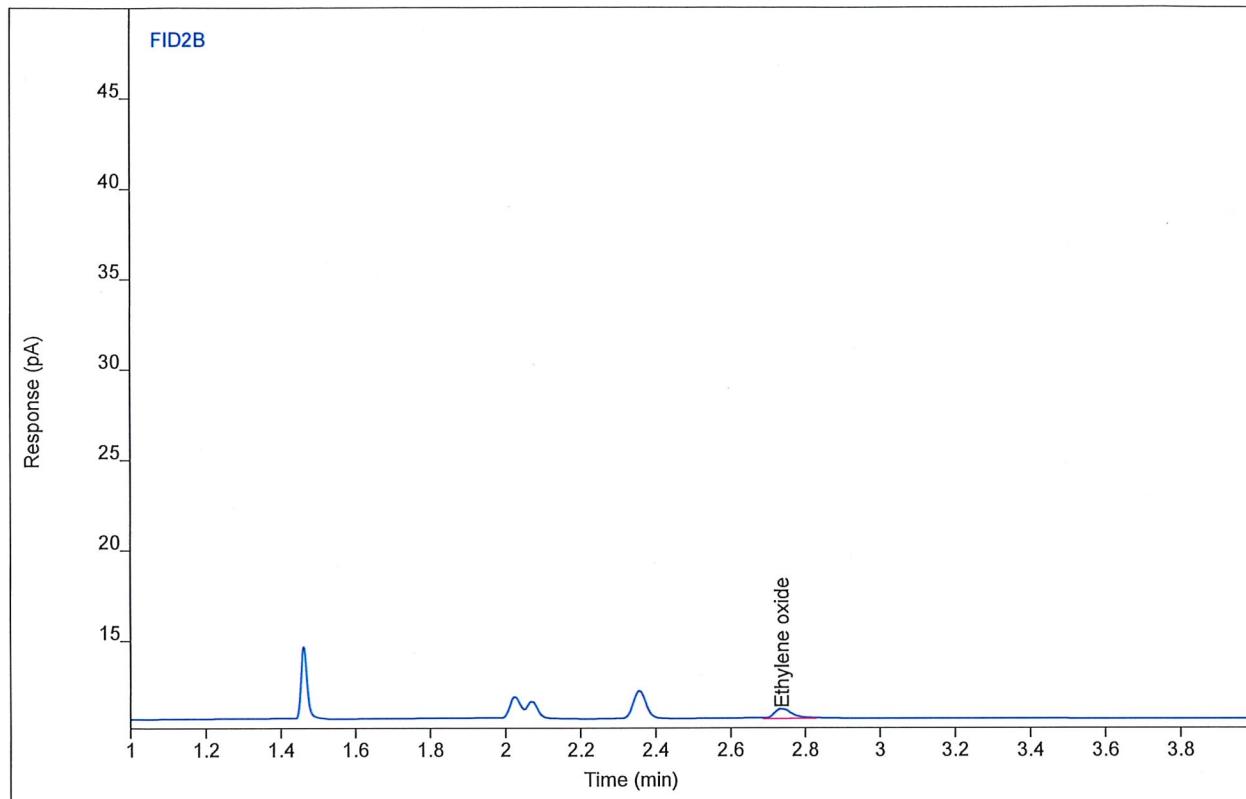


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.80940 | 0.58006 | 5.15530 | 1  | 5.15530 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration        |
| Sequence Name  | BETTYP1042 ver.3                     | Vial Number        | Vial 25            |
| Inj Data File  | 025B0503.D                           | Injection Volume   | 250                |
| File Location  | GC/2019/Betty/Quarter 1              | Injection          | 3 of 3             |
| Injection Date | 2/14/2019 11:30 AM                   | Acquisition Method | GC142P133_CAL.M    |
| File Modified  | 2/14/2019 12:44 PM                   | Analysis Method    | BETTYP1042_EO.M    |
| Instrument     | Betty                                | Method Modified    | 2/14/2019 11:47 AM |
| Operator       | Justin Guenzler                      | Printed            | 2/14/2019 12:53 PM |



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.77830 | 0.56343 | 5.07025 | 1  | 5.07025 | ppm  |

THE LINDE GROUP



**SHIPPED TO:** Enthalpy Analytical Inc.  
 3211 Bramer Drive  
 Raleigh , NC 27604

**PAGE:** 1 of 1

### CERTIFICATE OF ANALYSIS

|                     |                |                                  |
|---------------------|----------------|----------------------------------|
| Sales#:             | 116533174      | Cylinder Size: 152 (8" X 47.5")  |
| Production#:        | 1460819        | Cylinder # : CC-314745           |
| Certification Date: | Jul-13-2018    | Cylinder Pressure: 2000 psig     |
| P.O.# :             | PO1022200      | Cylinder Valve: CGA 350 / Steel  |
| Blend Type:         | CERTIFIED      | Cylinder Volume: 29.5 Liter      |
| Material#:          | 24102763       | Cylinder Material: Aluminum      |
| Traceability:       | NIST by weight | Gas Volume: 4000 Liters          |
| Expiration Date:    | Jul-13-2019    | Blend Tolerance: 5% Relative     |
| Do NOT use under:   | 150 psig       | Analytical Accuracy: 2% Relative |

| COMPONENT          | CAS NUMBER | REQUESTED CONC | CERTIFIED CONC |
|--------------------|------------|----------------|----------------|
| Acetylene          | 74-86-2    | 250 ppm        | 255 ppm        |
| Chloromethane      | 74-87-3    | 250 ppm        | 255 ppm        |
| Vinyl Chloride     | 75-01-4    | 250 ppm        | 255 ppm        |
| Dimethyl Ether     | 115-10-6   | 250 ppm        | 259 ppm        |
| Ethylene Oxide     | 75-21-8    | 250 ppm        | 256 ppm        |
| Methylene Chloride | 75-09-2    | 250 ppm        | 256 ppm        |
| Cyclohexane        | 110-82-7   | 250 ppm        | 257 ppm        |
| Isooctane          | 540-84-1   | 250 ppm        | 258 ppm        |
| <br>               |            |                |                |
| Nitrogen           | 7727-37-9  | Balance        | Balance        |

**ANALYST:** Lou Lorenzetti  
 Lou Lorenzetti

**DATE:** Jul-13-2018

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED HYDROCARBON**

Customer: \*MORRISVILLE , NC\* - MONTROSE ENVIRONMENTAL

GROUP

Part X02NI99C15ACKW8

Reference Number: 126-400875670-1

Number:

Cylinder CC122424

Cylinder Volume: 114.8 CF

Number:

Laboratory: 124 - LaPorte Mix (SAP) - TX

Cylinder Pressure: 1602 PSIG

Analysis Mar 09, 2017

Valve Outlet: 350

Date:

Lot Number: 126-400875670-1

Expiration Date: Mar 09, 2019

Traceability Statement: Hydrocarbon Process standards are NIST traceable either directly by weight or by comparison to Airgas laboratory standards that are directly NIST traceable by weight.

**CERTIFIED CONCENTRATIONS**

| Component      | Requested Concentration | Reported Volume % | Accuracy |
|----------------|-------------------------|-------------------|----------|
| ETHYLENE OXIDE | 250.0 PPM               | 242.6 PPM         | +/- 2%   |
| NITROGEN       | 99.98 %                 | 99.97574 %        | +/- 2%   |

Permanent Notes: MONTROSE ENVIRONMENTAL/ENTHALPY ANALYTICAL

Notes:.

RECERTIFICATION

PO # 1007021

MONTROSE ENVIRONMENTAL / ENTHALPY ANALYTICAL

  
Approved for Release

Page 1 of 126-400875670-1

=====  
6890 GC METHOD  
=====

## OVEN

Initial temp: 40 C (On)                    Maximum temp: 250 C  
 Initial time: 6.00 min                    Equilibration time: 0.50 min  
 Ramps:  
 #      Rate      Final temp      Final time      CRYO (N2)  
 1      30.00      220      2.00      Cryo: Off  
 2      0 (Off)                     Cryo fault: On  
 Post temp: 40 C                            Cryo timeout: 40.00 min (On)  
 Post time: 0.00 min                        Quick cryo cool: Off  
 Run time: 14.00 min                        Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.6 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.6 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 5/5/2014 at 7:51:02 AM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint         |
|------------|------------------------------|
| 3.00       | Front Detector Polarity: Off |

=====  
6890 GC METHOD  
=====

## OVEN

Initial temp: 40 C (On)  
 Initial time: 3.00 min  
 Ramps:  
   #   Rate   Final temp   Final time   CRYO (N2)  
   1   0 (Off)                                 Cryo: Off  
 Post temp: 40 C                                 Cryo fault: On  
 Post time: 0.00 min                             Cryo timeout: 40.00 min (On)  
 Run time: 3.00 min                                Quick cryo cool: Off  
                                                        Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.7 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.7 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 2/17/2014 at 5:52:35 PM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint |
|------------|----------------------|
|------------|----------------------|

=====

Calibration Table

=====

Calib. Data Modified : Wednesday, February 13, 2019 6:12:36 AM

Rel. Reference Window : 1.000 %  
Abs. Reference Window : 0.000 min  
Rel. Non-ref. Window : 1.000 %  
Abs. Non-ref. Window : 0.000 min  
Uncalibrated Peaks : using compound Ethylene oxide  
Partial Calibration : Yes, identified peaks are recalibrated  
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear  
Origin : Connected  
Weight : Quadratic (Amnt)

Recalibration Settings:  
Average Response : Average all calibrations  
Average Retention Time: Floating Average New 75%

Calibration Report Options :  
Printout of recalibrations within a sequence:  
Calibration Table after Recalibration  
Normal Report after Recalibration  
If the sequence is done with bracketing:  
Results of first cycle (ending previous bracket)

Signal 1: FID2 B,

| RetTime<br>[min] | Lvl<br>Sig | Amount<br>[ppm] | Area     | Amt/Area | Ref Grp | Name           |
|------------------|------------|-----------------|----------|----------|---------|----------------|
| 2.737            | 1          | 5.12000         | 1.60441  | 3.19120  |         | Ethylene oxide |
|                  | 2          | 25.60000        | 9.68536  | 2.64316  |         |                |
|                  | 3          | 78.77000        | 31.49280 | 2.50121  |         |                |
|                  | 4          | 256.00000       | 96.47888 | 2.65343  |         |                |

More compound-specific settings:

Compound: Ethylene oxide  
Time Window : From 2.691 min To 2.756 min

=====

Peak Sum Table

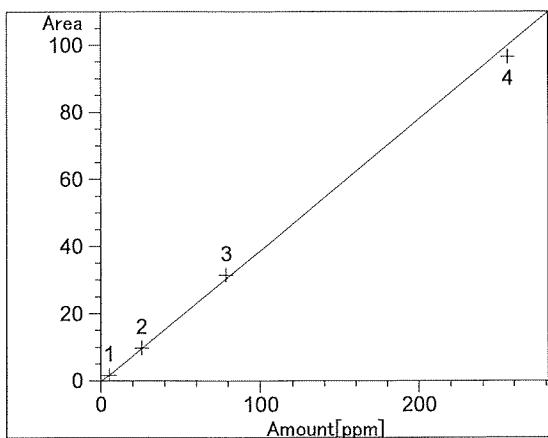
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\*\*\*No Entries in table\*\*\*

=====

Calibration Curves

=====

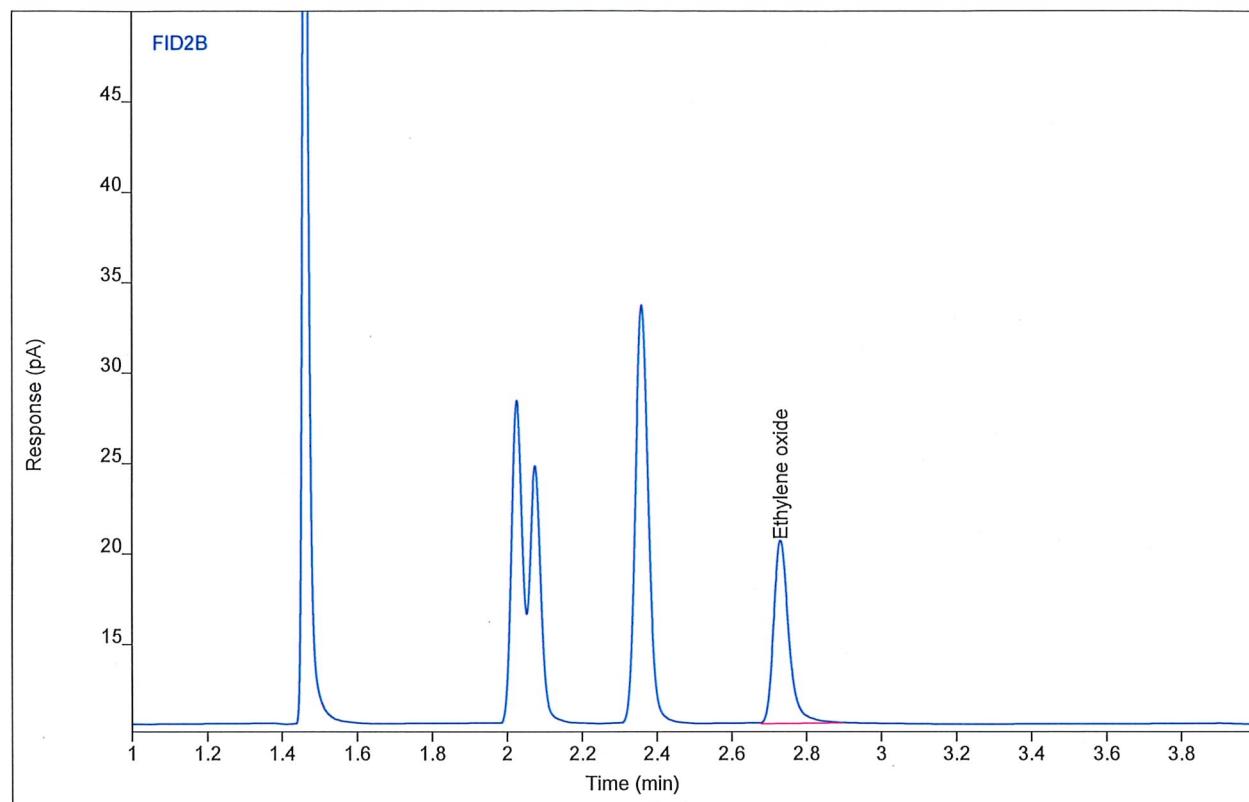


Ethylene oxide at exp. RT: 2.737  
FID2 B,  
Correlation: 0.99952  
Residual Std. Dev.: 2.57379  
Formula:  $y = mx + b$   
 $m: 3.92090e-1$   
 $b: -3.98386e-1$   
x: Amount  
y: Area  
Calibration Level Weights:  
Level 1 : 1  
Level 2 : 0.04  
Level 3 : 0.004225  
Level 4 : 0.0004

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                          |
|----------------|----------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration              |
| Sequence Name  | BETTYP1038 ver.4                 | Vial Number        | Vial 25                  |
| Inj Data File  | 025B0102.D                       | Injection Volume   | 250                      |
| File Location  | GC/2019/Betty/Quarter 1          | Injection          | 2 of 4                   |
| Injection Date | 2/12/2019 8:41 AM                | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/14/2019 11:52 AM               | Analysis Method    | BETTYP1042_EO_AVG_1038.M |
| Instrument     | Betty                            | Method Modified    | 2/14/2019 11:51 AM       |
| Operator       | Justin Guenzler                  | Printed            | 2/14/2019 12:42 PM       |



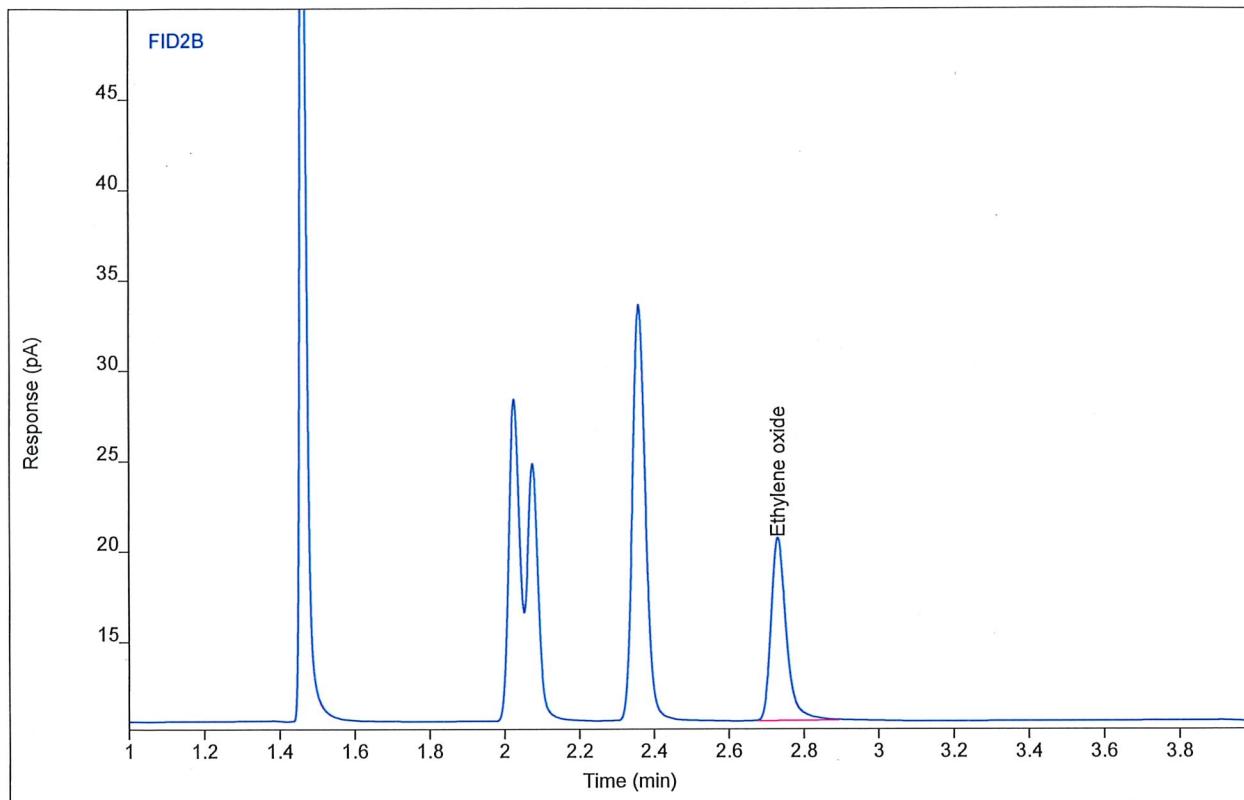
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.9029 | 10.1583 | 78.0776 | 1  | 78.0776 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0103.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 9:06 AM  
File Modified 2/14/2019 11:52 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



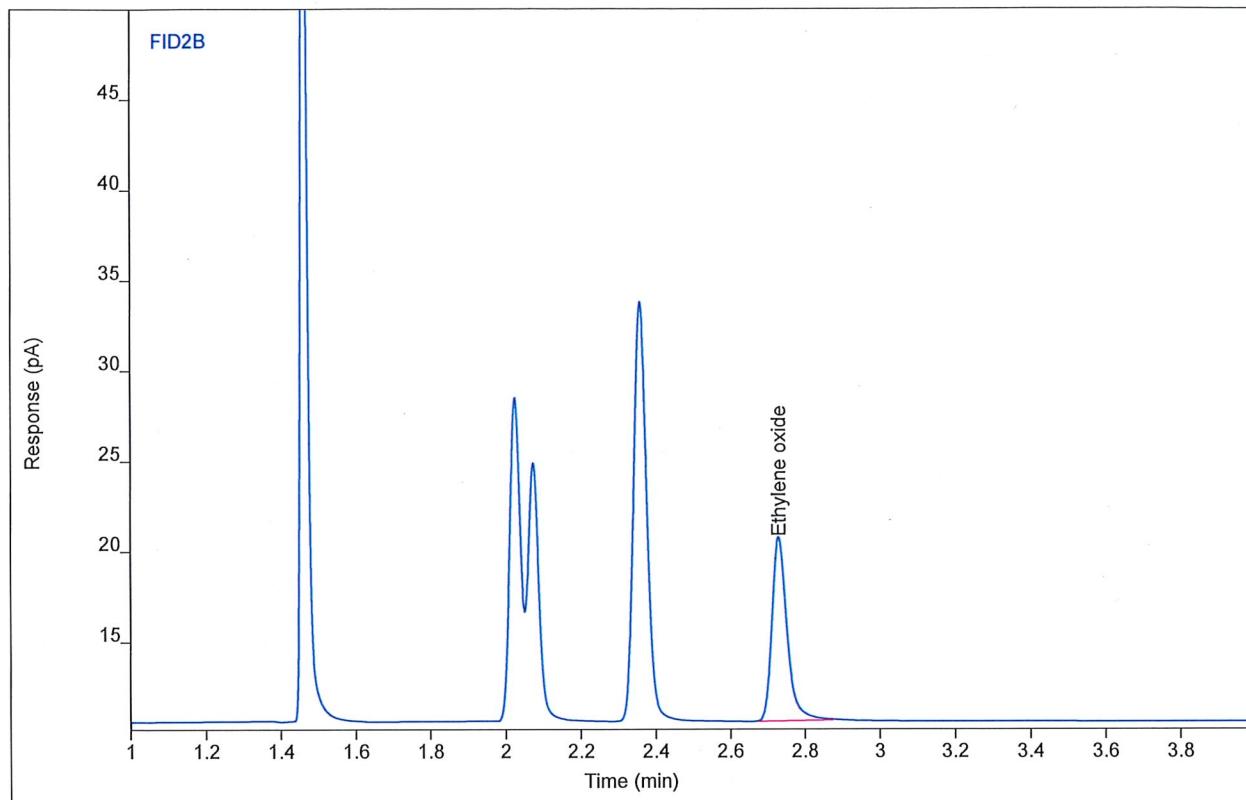
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.7840 | 10.1368 | 77.7591 | 1  | 77.7591 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0104.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 9:31 AM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



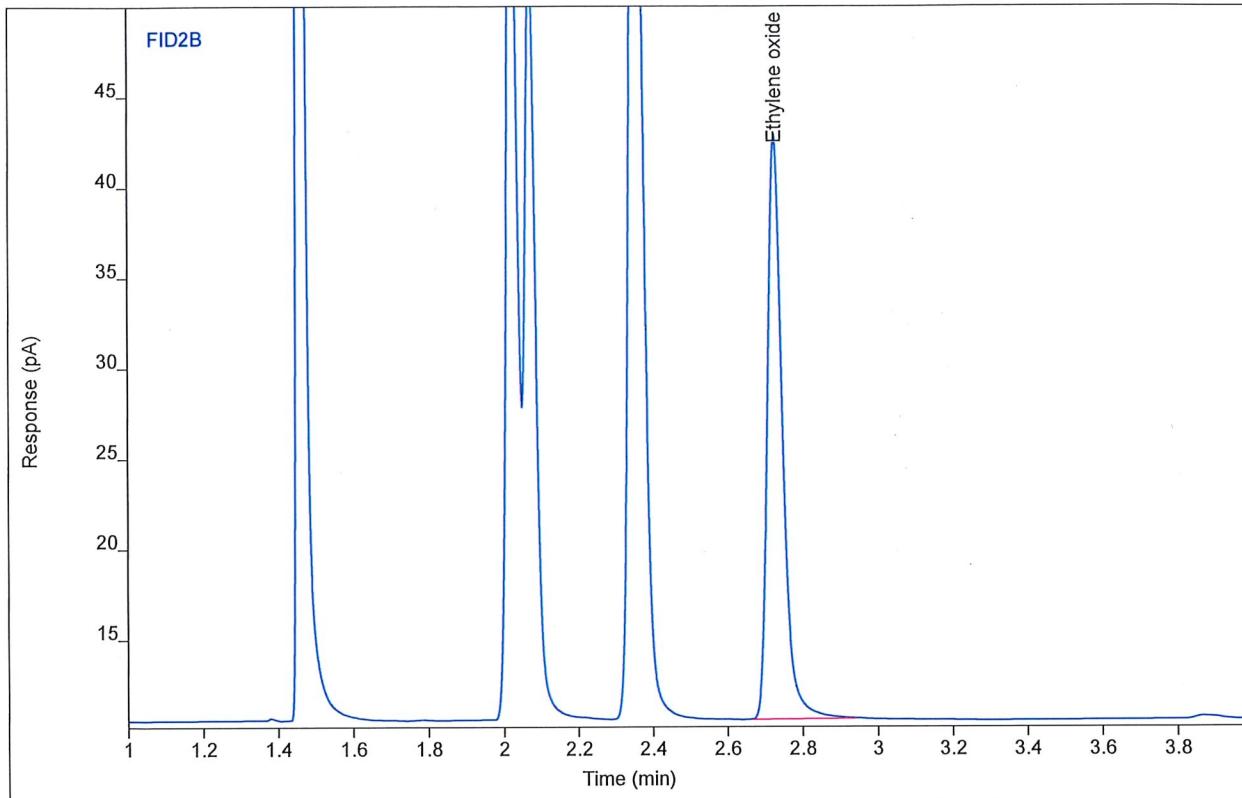
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.8121 | 10.1781 | 77.8342 | 1  | 77.8342 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 11:58 AM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



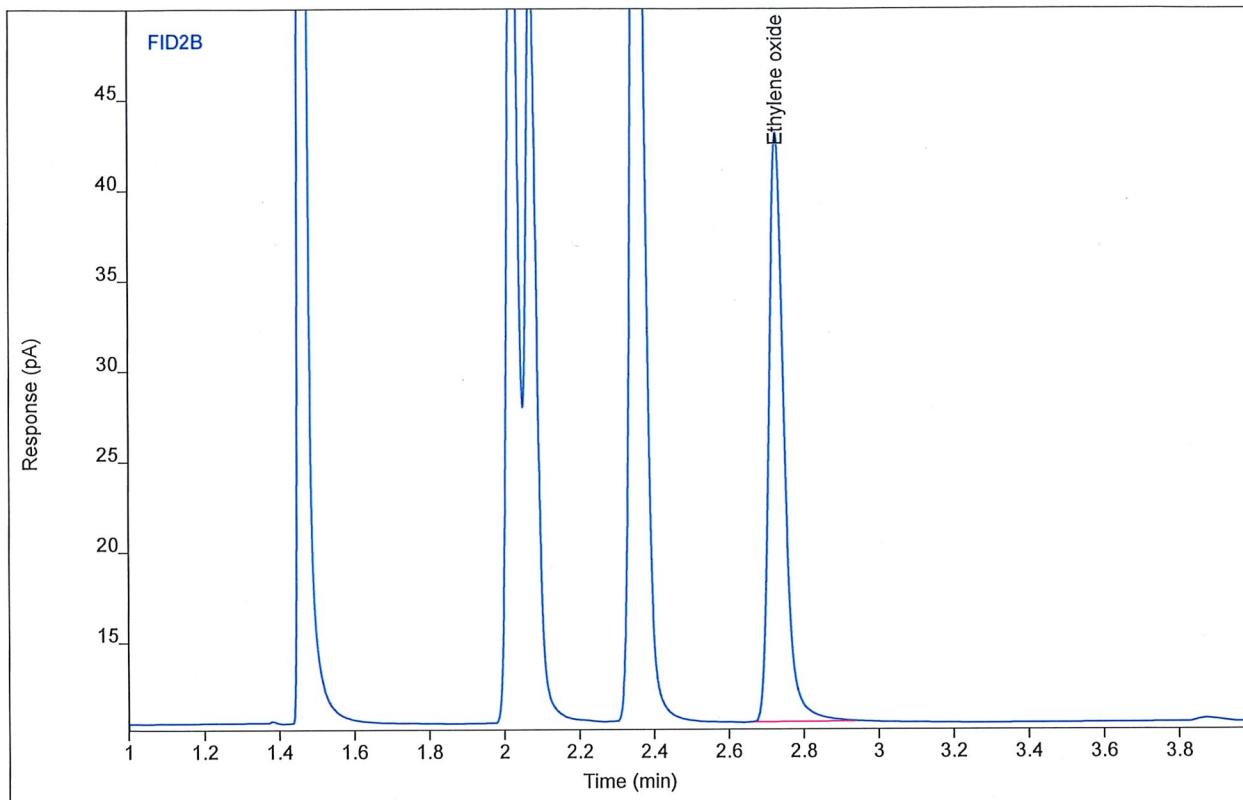
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 90.1178 | 32.3753 | 242.018 | 1  | 242.018 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 12:23 PM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



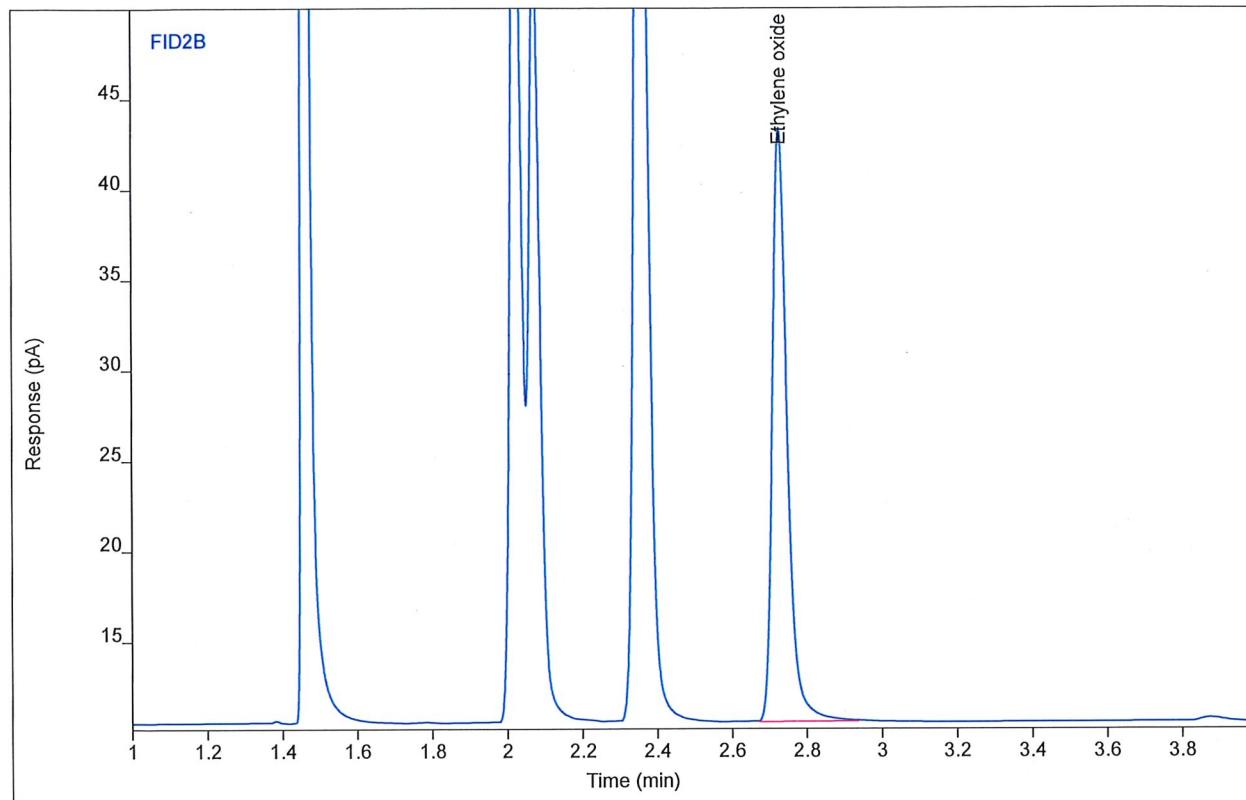
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 90.8804 | 32.5749 | 244.060 | 1  | 244.060 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0304.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 12:47 PM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



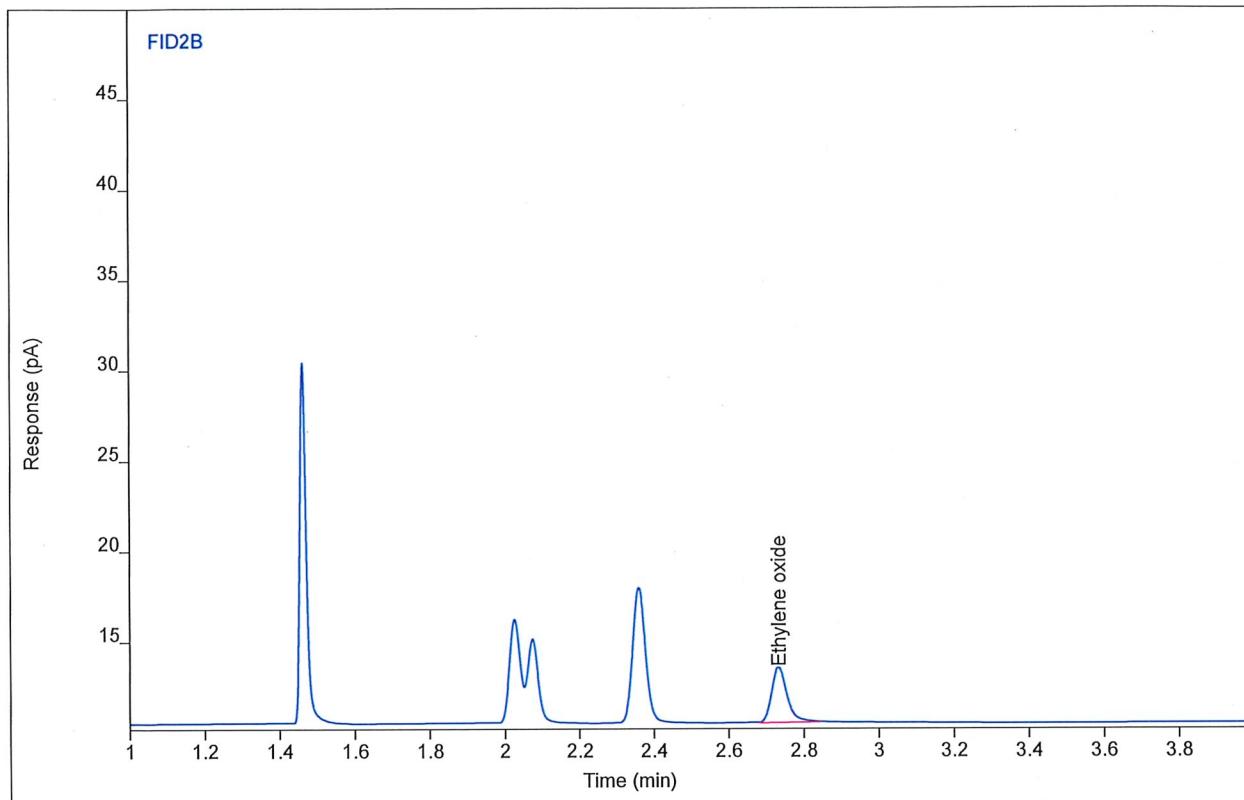
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 91.1803 | 32.8261 | 244.863 | 1  | 244.863 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 1:36 PM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



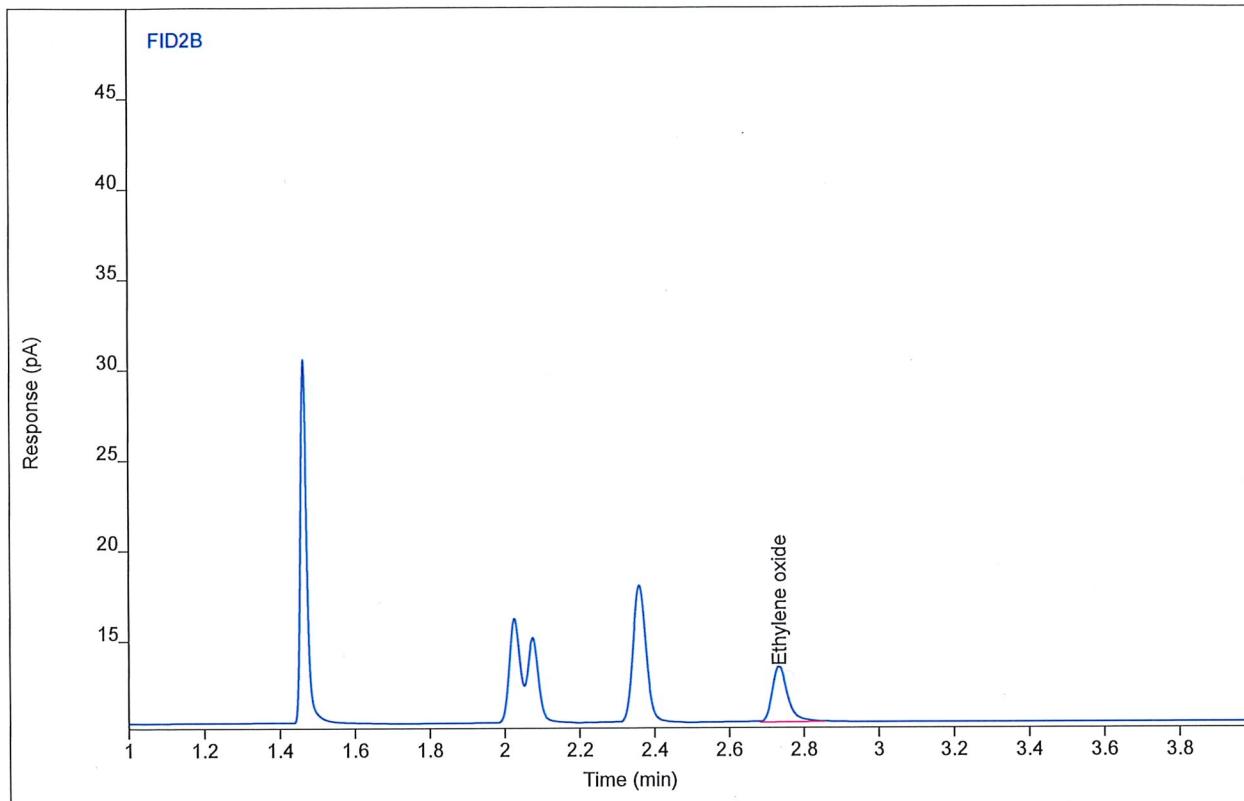
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.71569 | 3.07744 | 24.0140 | 1  | 24.0140 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 2:01 PM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM



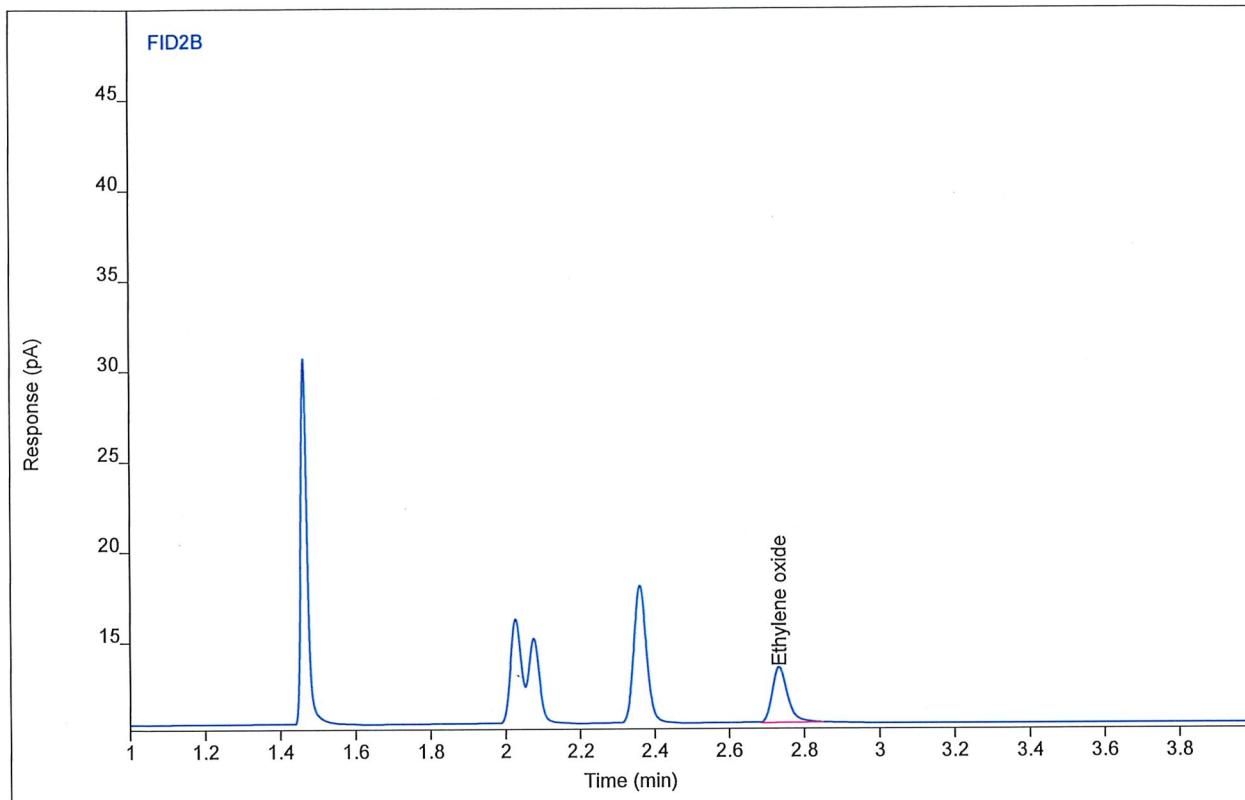
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.77991 | 3.09600 | 24.1860 | 1  | 24.1860 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1038 ver.4  
Inj Data File 025B0404.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 2:25 PM  
File Modified 2/14/2019 11:53 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 11:51 AM  
Printed 2/14/2019 12:42 PM

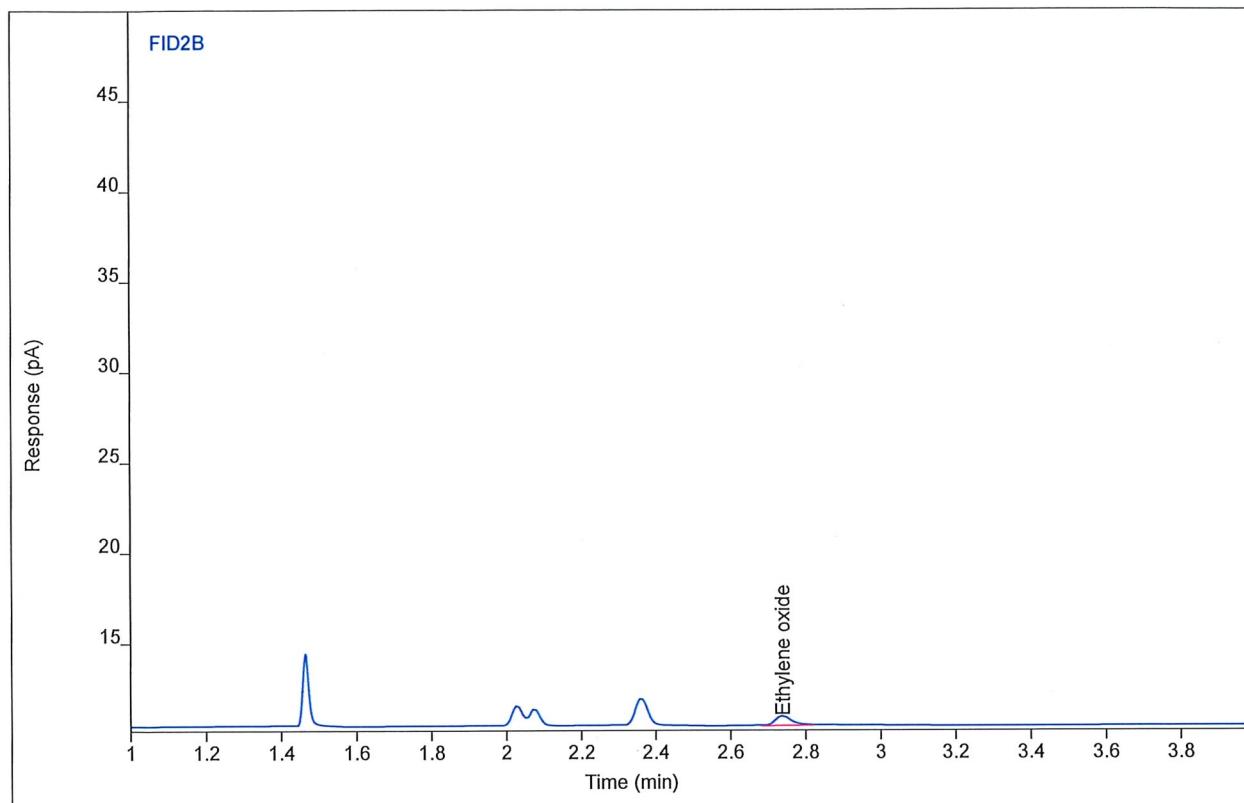


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.75797 | 3.10324 | 24.1272 | 1  | 24.1272 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                          |
|----------------|--------------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration              |
| Sequence Name  | BETTYP1038 ver.4                     | Vial Number        | Vial 25                  |
| Inj Data File  | 025B0502.D                           | Injection Volume   | 250                      |
| File Location  | GC/2019/Betty/Quarter 1              | Injection          | 2 of 4                   |
| Injection Date | 2/12/2019 3:15 PM                    | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/14/2019 11:53 AM                   | Analysis Method    | BETTYP1042_EO_AVG_1038.M |
| Instrument     | Betty                                | Method Modified    | 2/14/2019 11:51 AM       |
| Operator       | Justin Guenzler                      | Printed            | 2/14/2019 12:42 PM       |

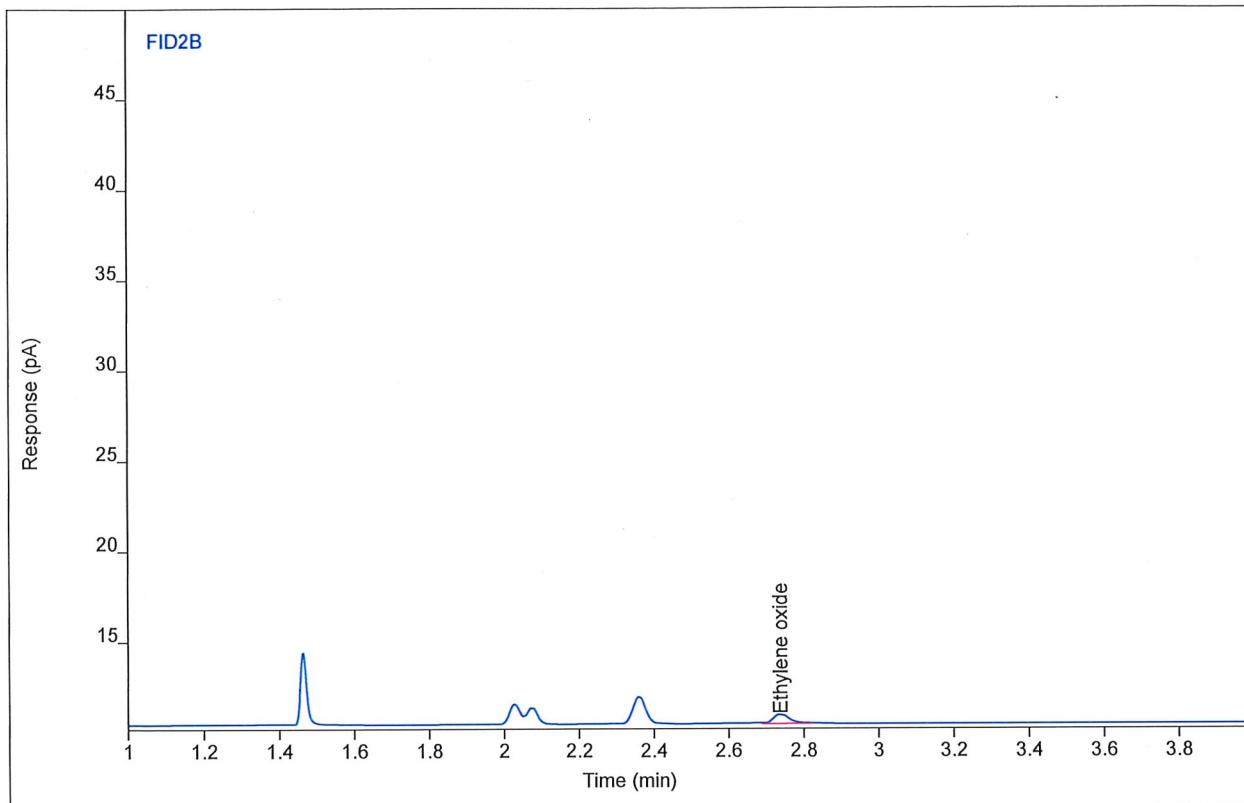


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.55800 | 0.53037 | 4.80336 | 1  | 4.80336 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                          |
|----------------|--------------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration              |
| Sequence Name  | BETTYP1038 ver.4                     | Vial Number        | Vial 25                  |
| Inj Data File  | 025B0503.D                           | Injection Volume   | 250                      |
| File Location  | GC/2019/Betty/Quarter 1              | Injection          | 3 of 4                   |
| Injection Date | 2/12/2019 3:40 PM                    | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/14/2019 11:53 AM                   | Analysis Method    | BETTYP1042_EO_AVG_1038.M |
| Instrument     | Betty                                | Method Modified    | 2/14/2019 11:51 AM       |
| Operator       | Justin Guenzler                      | Printed            | 2/14/2019 12:42 PM       |

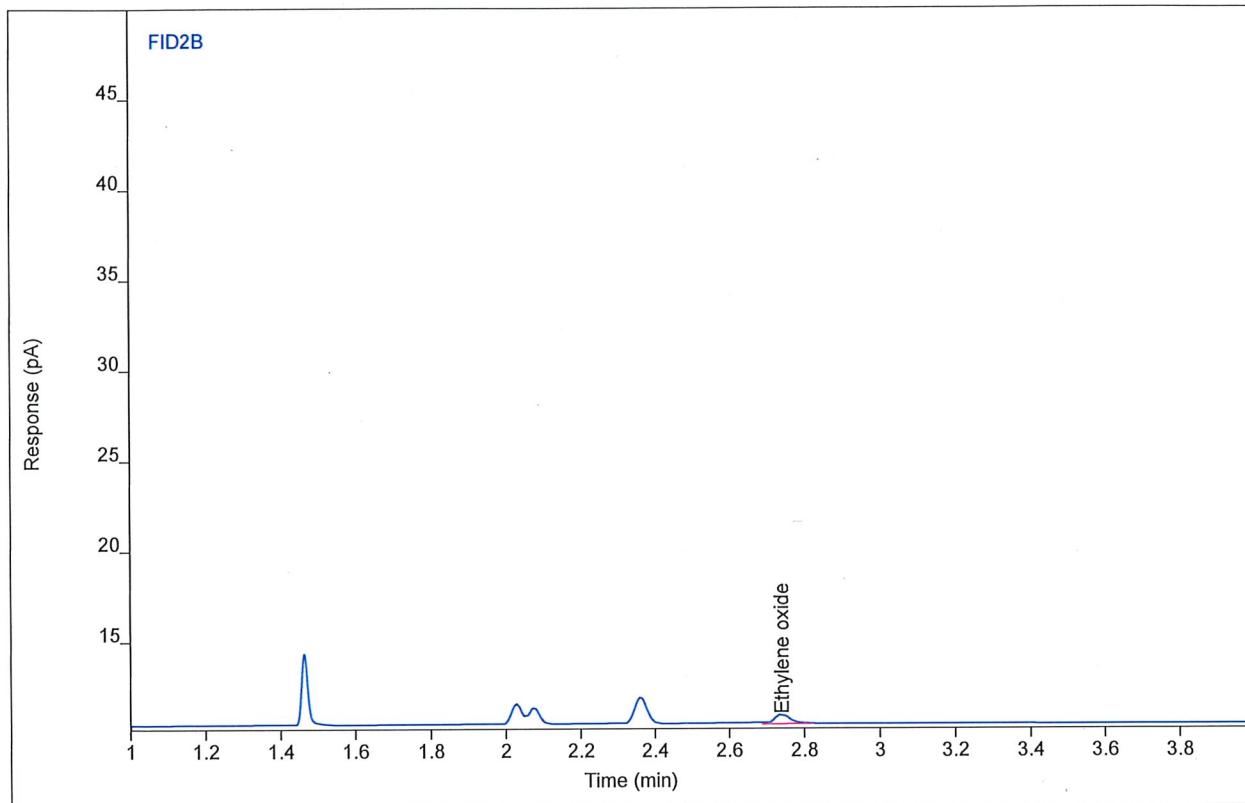


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.52873 | 0.52595 | 4.71311 | 1  | 4.71311 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                          |
|----------------|--------------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration              |
| Sequence Name  | BETTYP1038 ver.4                     | Vial Number        | Vial 25                  |
| Inj Data File  | 025B0504.D                           | Injection Volume   | 250                      |
| File Location  | GC/2019/Betty/Quarter 1              | Injection          | 4 of 4                   |
| Injection Date | 2/12/2019 4:04 PM                    | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/14/2019 11:54 AM                   | Analysis Method    | BETTYP1042_EO_AVG_1038.M |
| Instrument     | Betty                                | Method Modified    | 2/14/2019 11:51 AM       |
| Operator       | Justin Guenzler                      | Printed            | 2/14/2019 12:42 PM       |



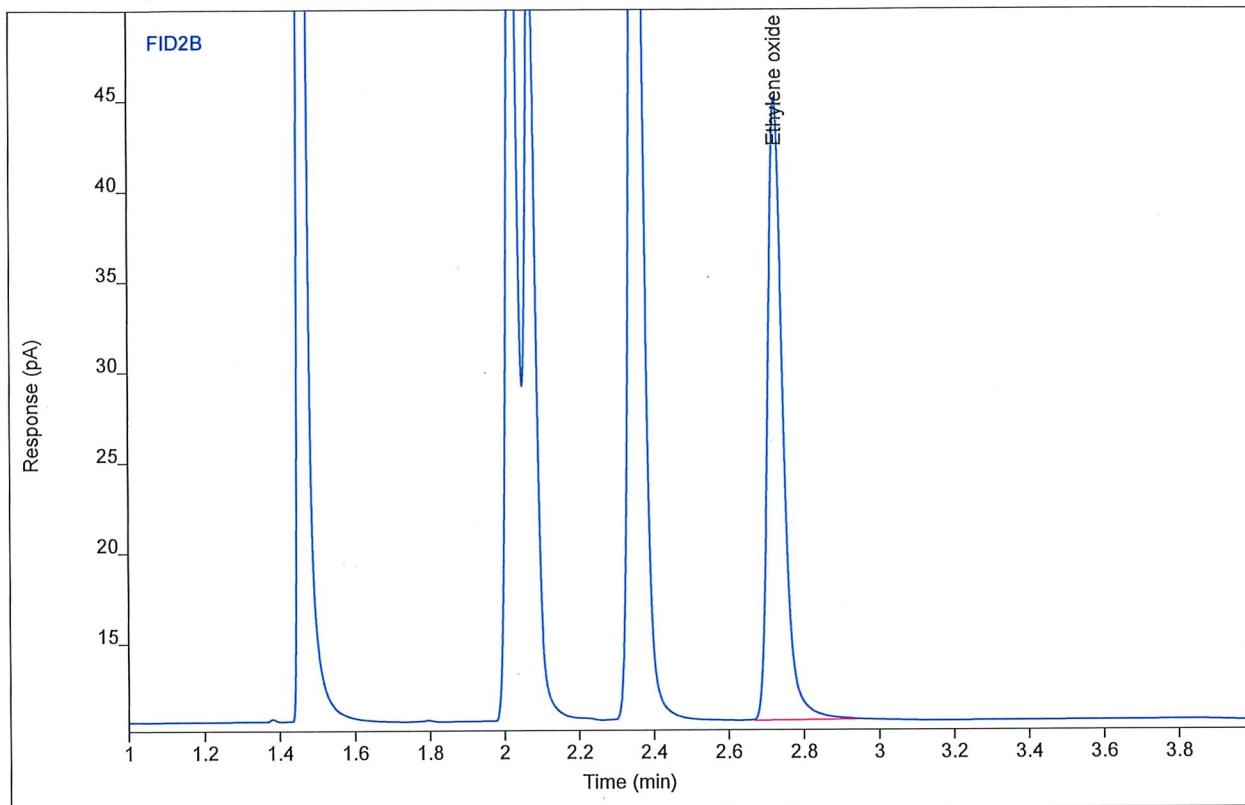
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.50002 | 0.52024 | 4.62459 | 1  | 4.62459 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0201.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 7:00 AM  
File Modified 2/14/2019 12:36 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 1 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



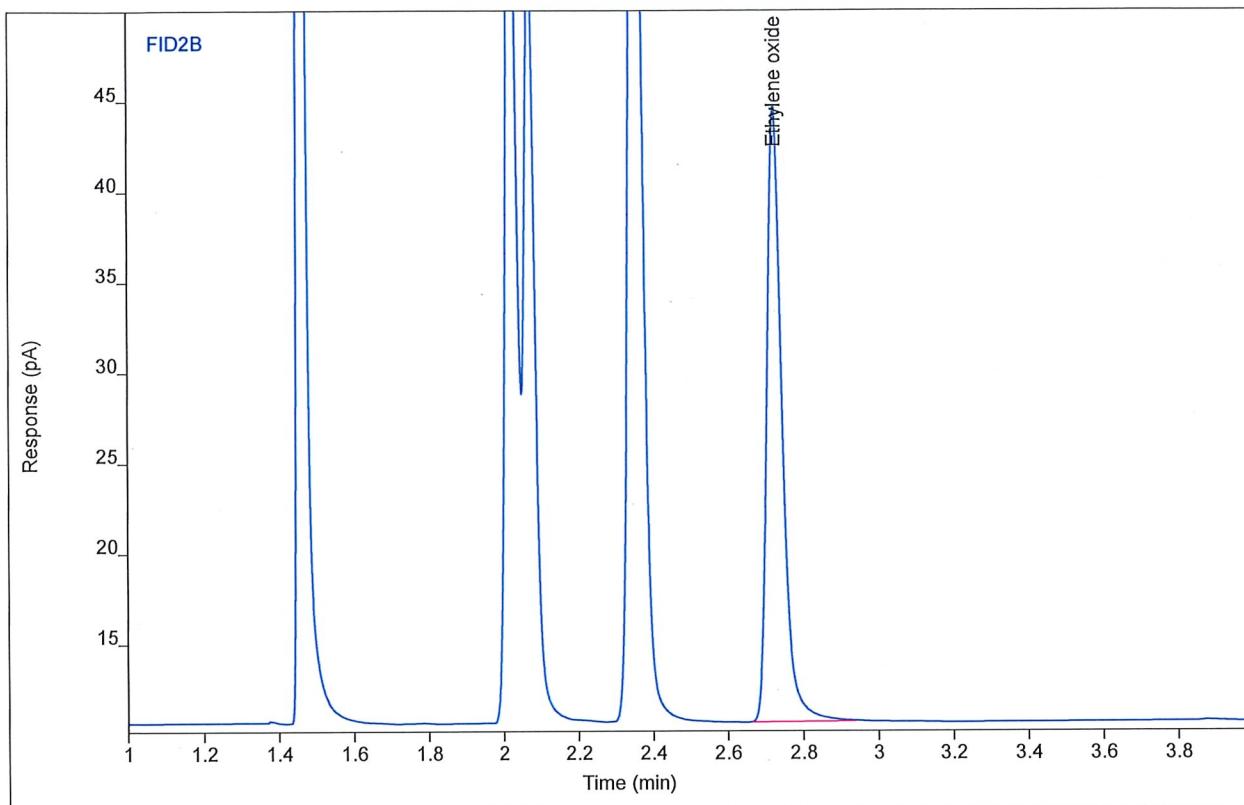
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 96.9863 | 34.4293 | 260.412 | 1  | 260.412 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0202.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 7:24 AM  
File Modified 2/14/2019 12:36 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



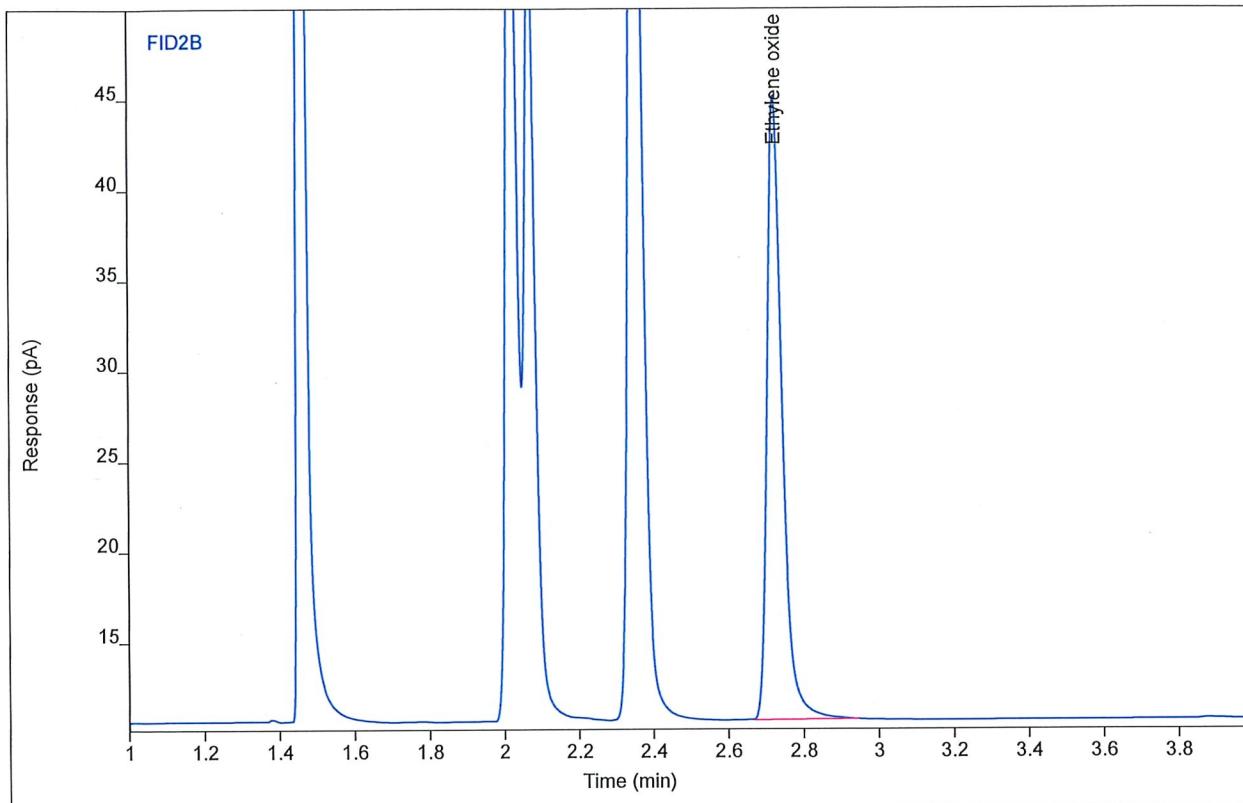
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 95.6208 | 34.0494 | 256.755 | 1  | 256.755 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0203.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 7:49 AM  
File Modified 2/14/2019 12:36 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



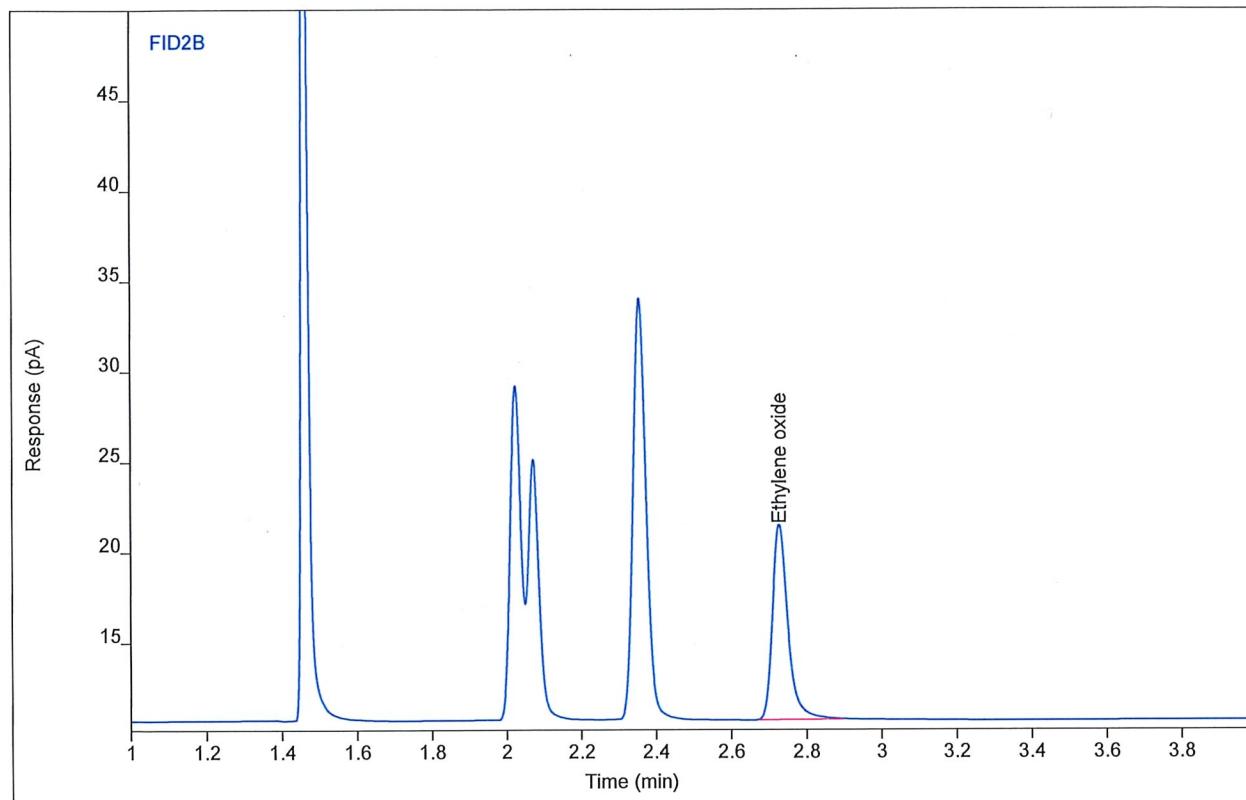
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 96.7236 | 34.4782 | 259.709 | 1  | 259.709 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0301.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 8:13 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



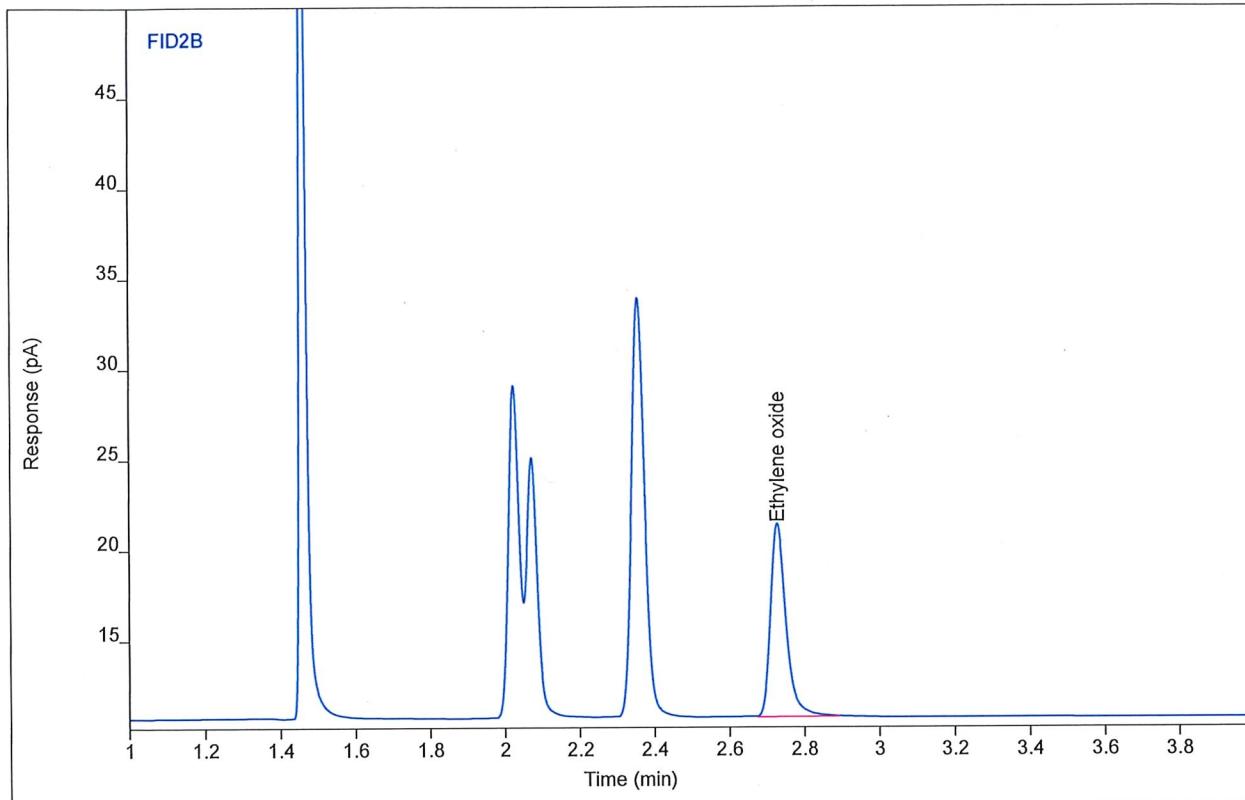
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 31.0879 | 10.8264 | 83.9292 | 1  | 83.9292 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 8:38 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



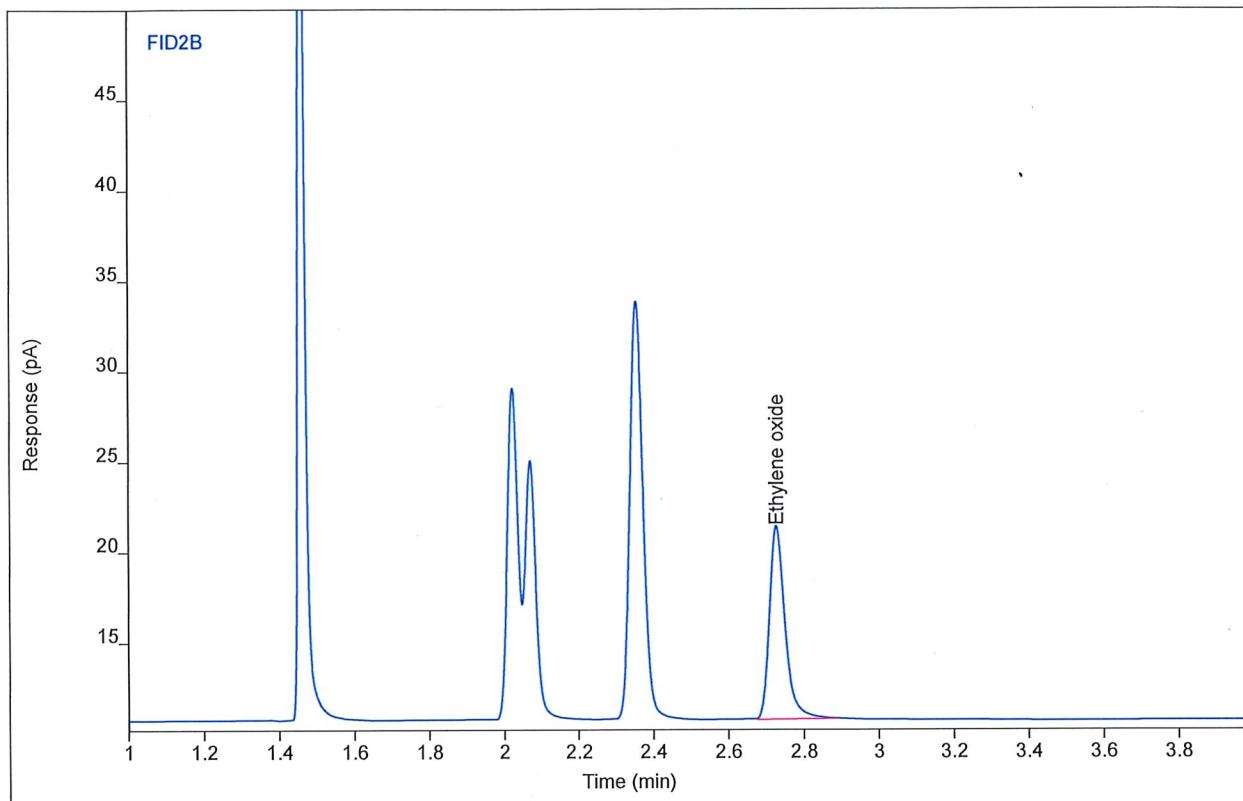
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 30.7244 | 10.7262 | 82.9558 | 1  | 82.9558 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 9:03 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



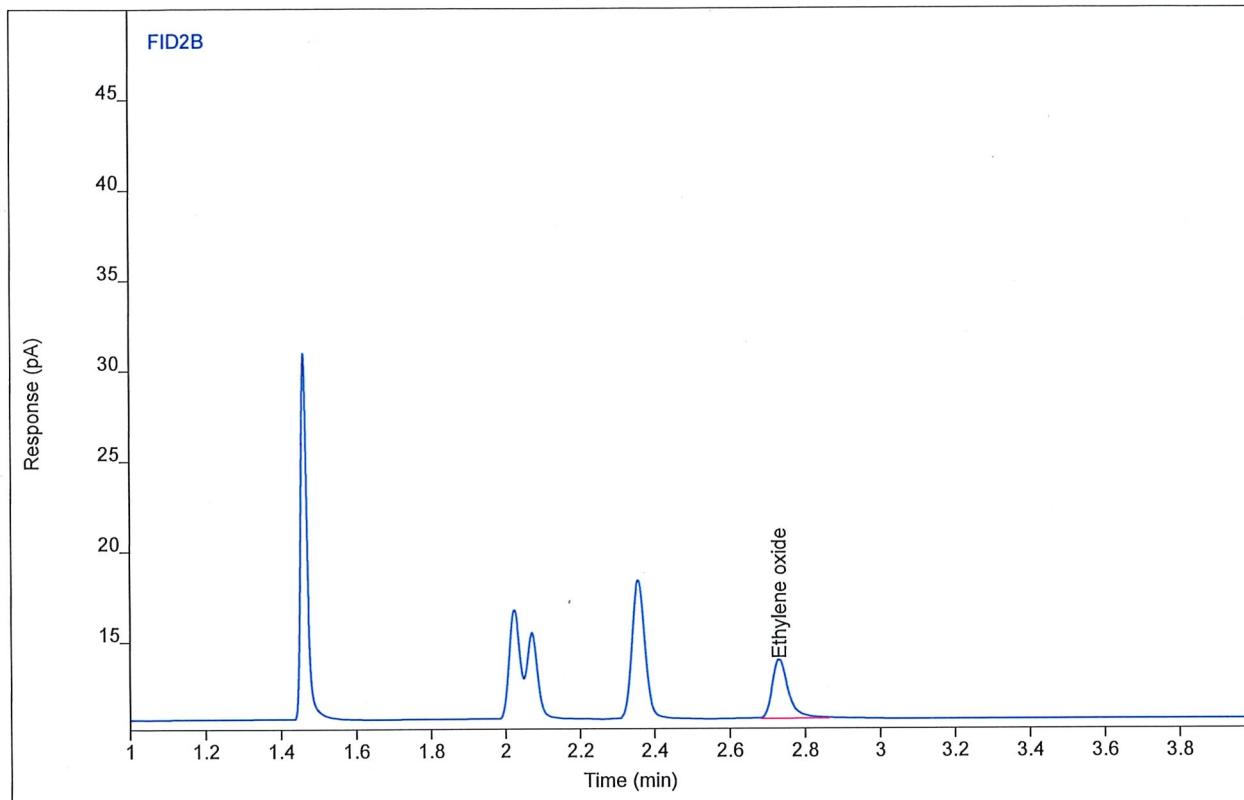
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 30.7665 | 10.7125 | 83.0684 | 1  | 83.0684 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0401.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 9:27 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 1 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



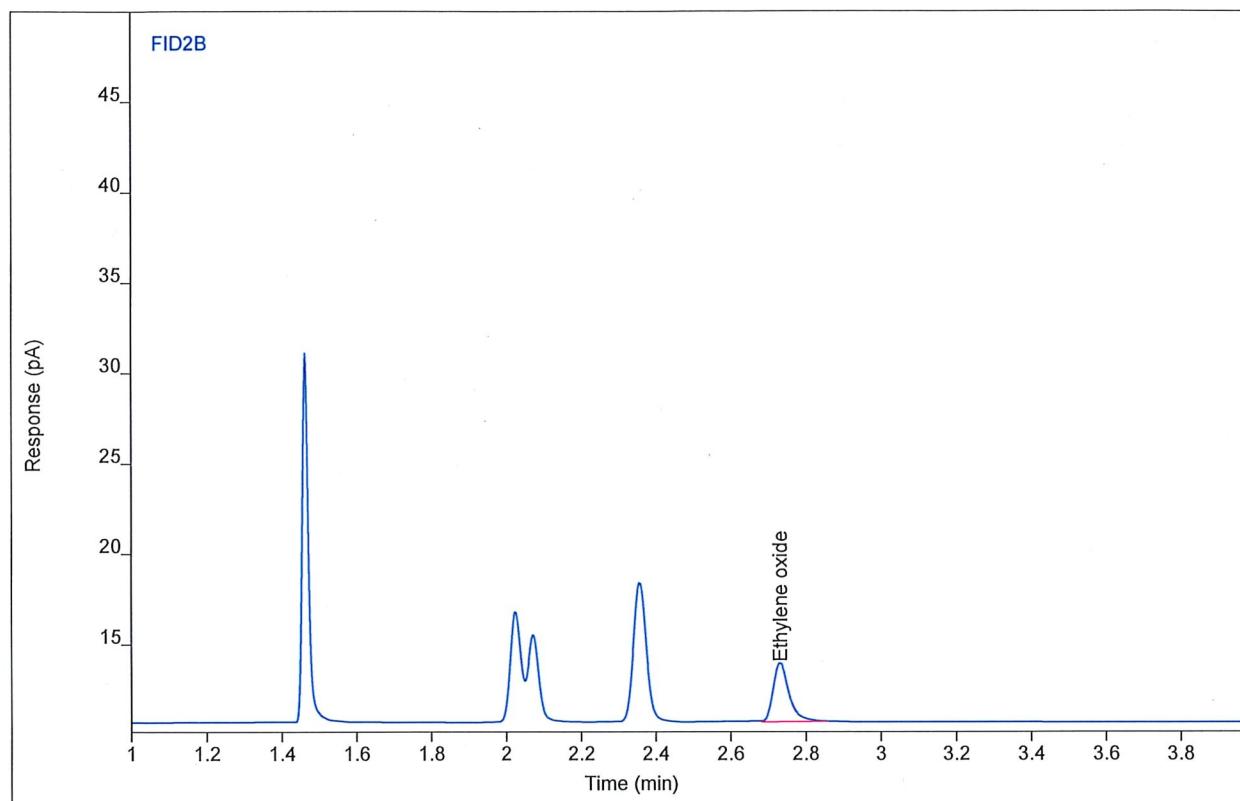
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.68032 | 3.28394 | 26.5974 | 1  | 26.5974 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name : BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name : BETTYP1042 ver.2  
Inj Data File : 025B0402.D  
File Location : GC/2019/Betty/Quarter 1  
Injection Date : 2/14/2019 9:52 AM  
File Modified : 2/14/2019 12:37 PM  
Instrument : Betty  
Operator : Justin Guenzler

Sample Type :  
Vial Number :  
Injection Volume :  
Injection :  
Acquisition Method :  
Analysis Method :  
Method Modified :  
Printed :  
Calibration :  
Vial 25  
250  
2 of 3  
GC142P133\_CAL.M  
BETTYP1042\_EO\_AVG\_1038.M  
2/14/2019 12:17 PM  
2/14/2019 12:42 PM



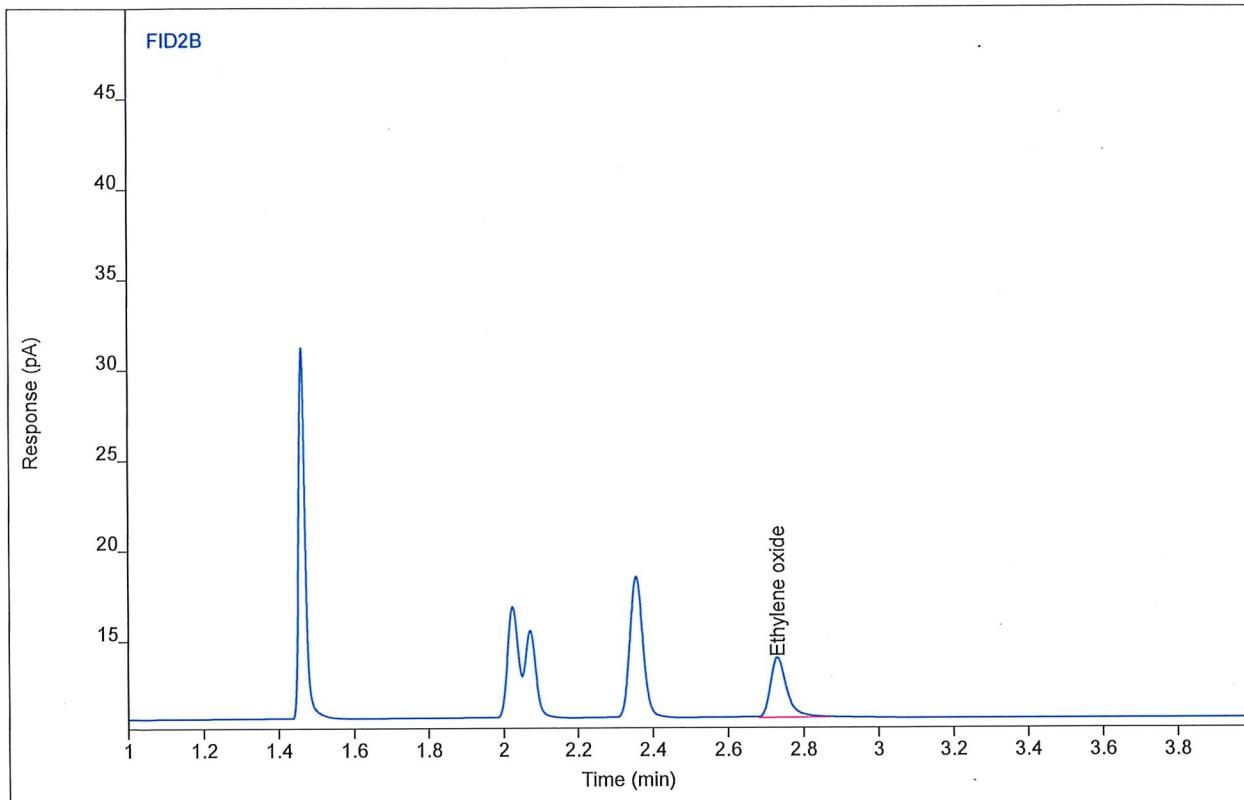
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.74881 | 3.30236 | 26.7808 | 1  | 26.7808 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 10:16 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



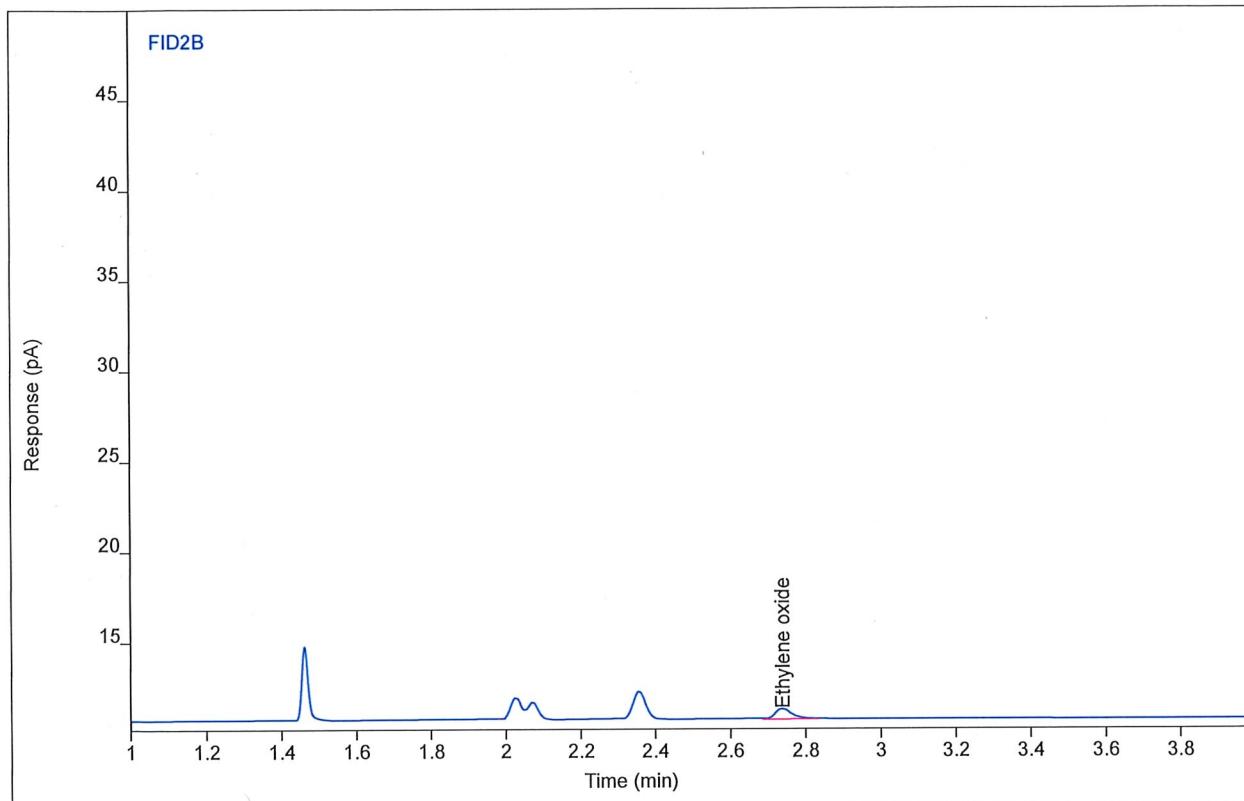
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.89309 | 3.35093 | 27.1672 | 1  | 27.1672 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0501.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 10:41 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 1 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



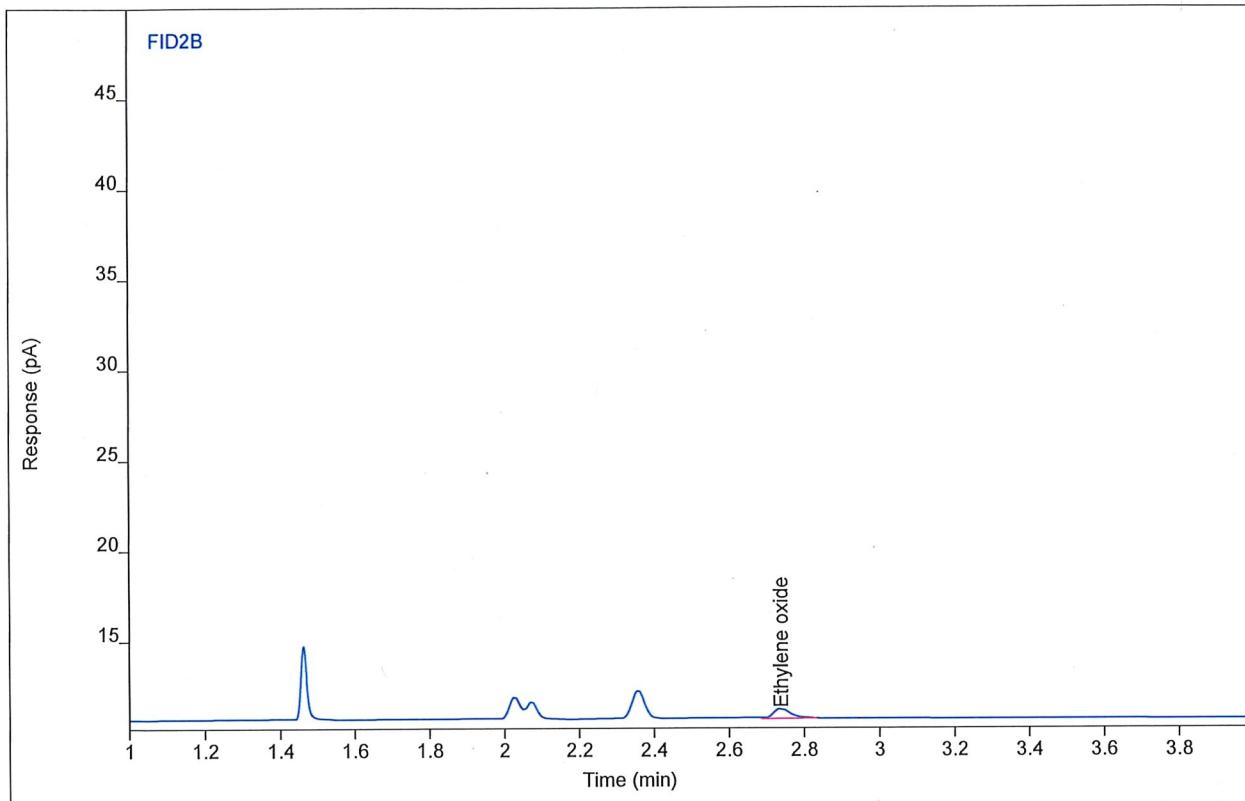
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.78751 | 0.58006 | 5.45958 | 1  | 5.45958 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0502.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 11:06 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



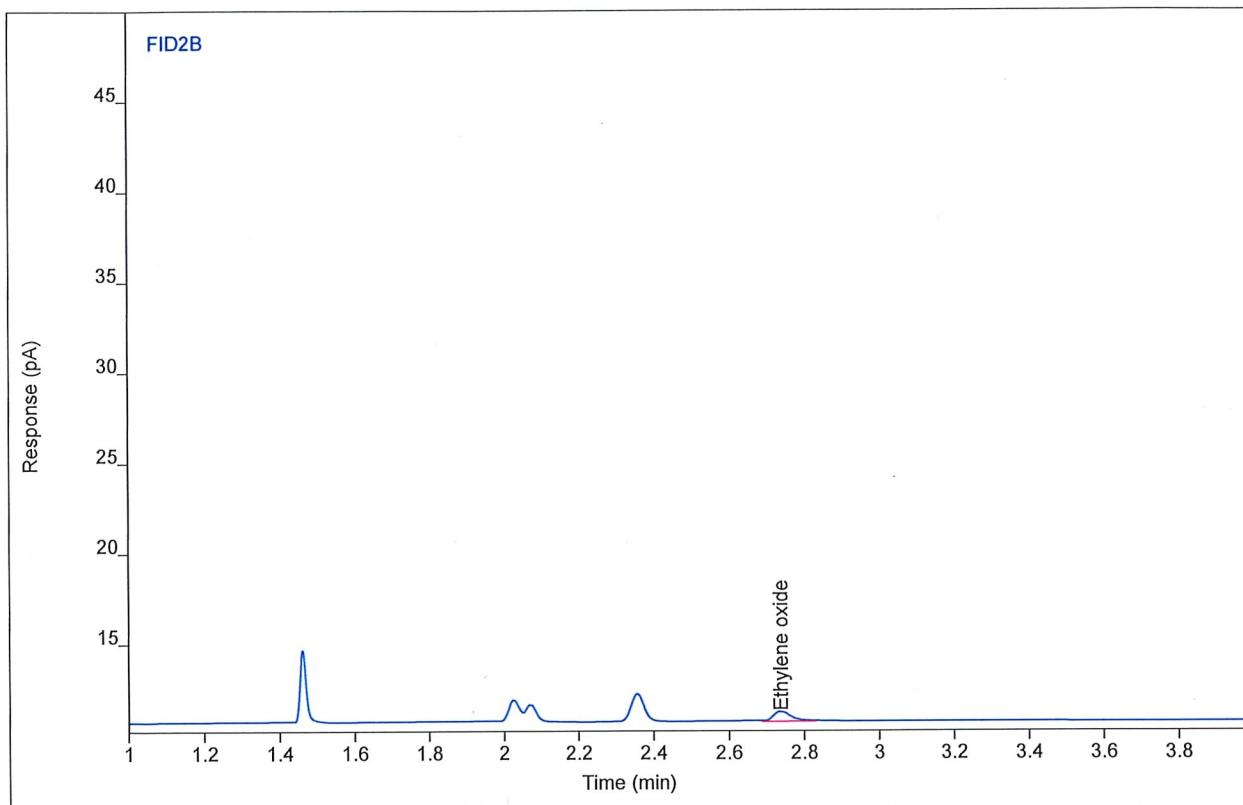
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.80940 | 0.58006 | 5.51821 | 1  | 5.51821 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BETTYP1042 ver.2  
Inj Data File 025B0503.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/14/2019 11:30 AM  
File Modified 2/14/2019 12:37 PM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1042\_EO\_AVG\_1038.M  
Method Modified 2/14/2019 12:17 PM  
Printed 2/14/2019 12:42 PM



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.77830 | 0.56343 | 5.43493 | 1  | 5.43493 | ppm  |

THE LINDE GROUP



**SHIPPED TO:** Enthalpy Analytical Inc.  
 3211 Bramer Drive  
 Raleigh , NC 27604

**PAGE:** 1 of 1

### CERTIFICATE OF ANALYSIS

|                     |                |                      |                  |
|---------------------|----------------|----------------------|------------------|
| Sales#:             | 116533174      | Cylinder Size:       | 152 (8" X 47.5") |
| Production#:        | 1460819        | Cylinder # :         | CC-314745        |
| Certification Date: | Jul-13-2018    | Cylinder Pressure:   | 2000 psig        |
| P.O.# :             | PO1022200      | Cylinder Valve:      | CGA 350 / Steel  |
| Blend Type:         | CERTIFIED      | Cylinder Volume:     | 29.5 Liter       |
| Material#:          | 24102763       | Cylinder Material:   | Aluminum         |
| Traceability:       | NIST by weight | Gas Volume:          | 4000 Liters      |
| Expiration Date:    | Jul-13-2019    | Blend Tolerance:     | 5% Relative      |
| Do NOT use under:   | 150 psig       | Analytical Accuracy: | 2% Relative      |

| COMPONENT          | CAS NUMBER | REQUESTED CONC | CERTIFIED CONC |
|--------------------|------------|----------------|----------------|
| Acetylene          | 74-86-2    | 250 ppm        | 255 ppm        |
| Chloromethane      | 74-87-3    | 250 ppm        | 255 ppm        |
| Vinyl Chloride     | 75-01-4    | 250 ppm        | 255 ppm        |
| Dimethyl Ether     | 115-10-6   | 250 ppm        | 259 ppm        |
| Ethylene Oxide     | 75-21-8    | 250 ppm        | 256 ppm        |
| Methylene Chloride | 75-09-2    | 250 ppm        | 256 ppm        |
| Cyclohexane        | 110-82-7   | 250 ppm        | 257 ppm        |
| Isooctane          | 540-84-1   | 250 ppm        | 258 ppm        |
| <br>               |            |                |                |
| Nitrogen           | 7727-37-9  | Balance        | Balance        |

**ANALYST:** Lou Lorenzetti  
 Lou Lorenzetti

**DATE:** Jul-13-2018

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED HYDROCARBON**Customer: \*MORRISVILLE , NC\* - MONTROSE ENVIRONMENTAL  
GROUP

Part X02NI99C15ACKW8

Reference Number: 126-400875670-1

Number:

Cylinder CC122424

Cylinder Volume: 114.8 CF

Number:

Laboratory: 124 - LaPorte Mix (SAP) - TX

Cylinder Pressure: 1602 PSIG

Analysis Mar 09, 2017

Valve Outlet: 350

Date:

Lot Number: 126-400875670-1

Expiration Date: Mar 09, 2019

Traceability Statement: Hydrocarbon Process standards are NIST traceable either directly by weight or by comparison to Airgas laboratory standards that are directly NIST traceable by weight.

**CERTIFIED CONCENTRATIONS**

| Component      | Requested Concentration | Reported Volume % | Accuracy |
|----------------|-------------------------|-------------------|----------|
| ETHYLENE OXIDE | 250.0 PPM               | 242.6 PPM         | +/- 2%   |
| NITROGEN       | 99.98 %                 | 99.97574 %        | +/- 2%   |

Permanent Notes: MONTROSE ENVIRONMENTAL/ENTHALPY ANALYTICAL

Notes:

RECERTIFICATION

PO # 1007021

MONTROSE ENVIRONMENTAL / ENTHALPY ANALYTICAL

  
Approved for Release

Page 1 of 126-400875670-1

=====  
6890 GC METHOD  
=====

## OVEN

Initial temp: 40 C (On)  
 Initial time: 6.00 min  
 Ramps:  
 # Rate Final temp Final time CRYO (N2)  
 1 30.00 220 2.00 Cryo: Off  
 2 0 (Off) Cryo fault: On  
 Post temp: 40 C Cryo timeout: 40.00 min (On)  
 Post time: 0.00 min Quick cryo cool: Off  
 Run time: 14.00 min Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.6 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.6 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 5/5/2014 at 7:51:02 AM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint         |
|------------|------------------------------|
| 3.00       | Front Detector Polarity: Off |

=====  
6890 GC METHOD  
=====

## OVEN

Initial temp: 40 C (On) Maximum temp: 250 C  
 Initial time: 3.00 min Equilibration time: 0.50 min  
 Ramps:  
 # Rate Final temp Final time CRYO (N2)  
 1 0 (Off) Cryo: Off  
 Post temp: 40 C Cryo fault: On  
 Post time: 0.00 min Cryo timeout: 40.00 min (On)  
 Run time: 3.00 min Quick cryo cool: Off  
 Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.7 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.7 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 2/17/2014 at 5:52:35 PM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint |
|------------|----------------------|
|------------|----------------------|

=====

Calibration Table

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General Calibration Setting

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Calib. Data Modified : Wednesday, February 13, 2019 5:44:52 AM  
Signals calculated separately : No

Rel. Reference Window : 1.000 %  
Abs. Reference Window : 0.000 min  
Rel. Non-ref. Window : 1.000 %  
Abs. Non-ref. Window : 0.000 min  
Uncalibrated Peaks : using compound Ethylene oxide  
Partial Calibration : Yes, identified peaks are recalibrated  
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear  
Origin : Connected  
Weight : Quadratic (Amnt)

Recalibration Settings:  
Average Response : Average all calibrations  
Average Retention Time: Floating Average New 75%

Calibration Report Options :  
Printout of recalibrations within a sequence:  
    Calibration Table after Recalibration  
    Normal Report after Recalibration  
If the sequence is done with bracketing:  
    Results of first cycle (ending previous bracket)

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Signal Details

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Signal 1: FID2 B,

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Overview Table

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| RT    | Sig | Lvl | Amount<br>[ppm] | Area     | Rsp.Factor | Ref | ISTD | # | Compound       |
|-------|-----|-----|-----------------|----------|------------|-----|------|---|----------------|
| 2.739 | 1   | 1   | 5.12000         | 1.52892  | 3.34877    | No  | No   |   | Ethylene oxide |
|       |     | 2   | 25.60000        | 8.75119  | 2.92532    |     |      |   |                |
|       |     | 3   | 78.77000        | 28.83302 | 2.73194    |     |      |   |                |
|       |     | 4   | 256.00000       | 90.72618 | 2.82168    |     |      |   |                |

-----

More compound-specific settings

Compound: Ethylene oxide

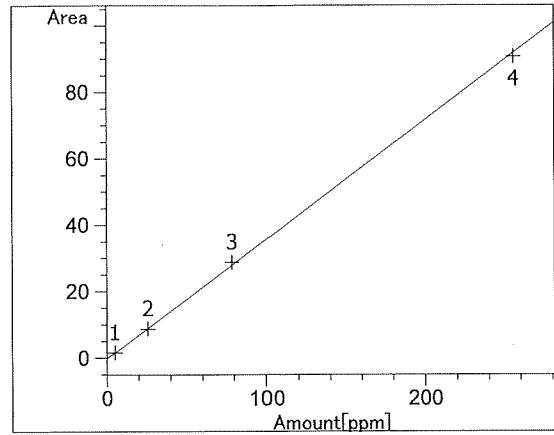
Time Window

: From 2.692 min To 2.758 min

Peak Sum Table

\*\*\*No Entries in table\*\*\*

Calibration Curves



Ethylen oxide at exp. RT: 2.739

FID2 B,

Correlation: 0.99976

Residual Std. Dev.: 0.99971

Formula:  $y = mx + b$

m: 3.60219e-1

b: -3.18658e-1

x: Amount [ppm]

y: Area

Calibration Level Weights:

Level 1 : 1

Level 2 : 0.04

Level 3 : 0.004225

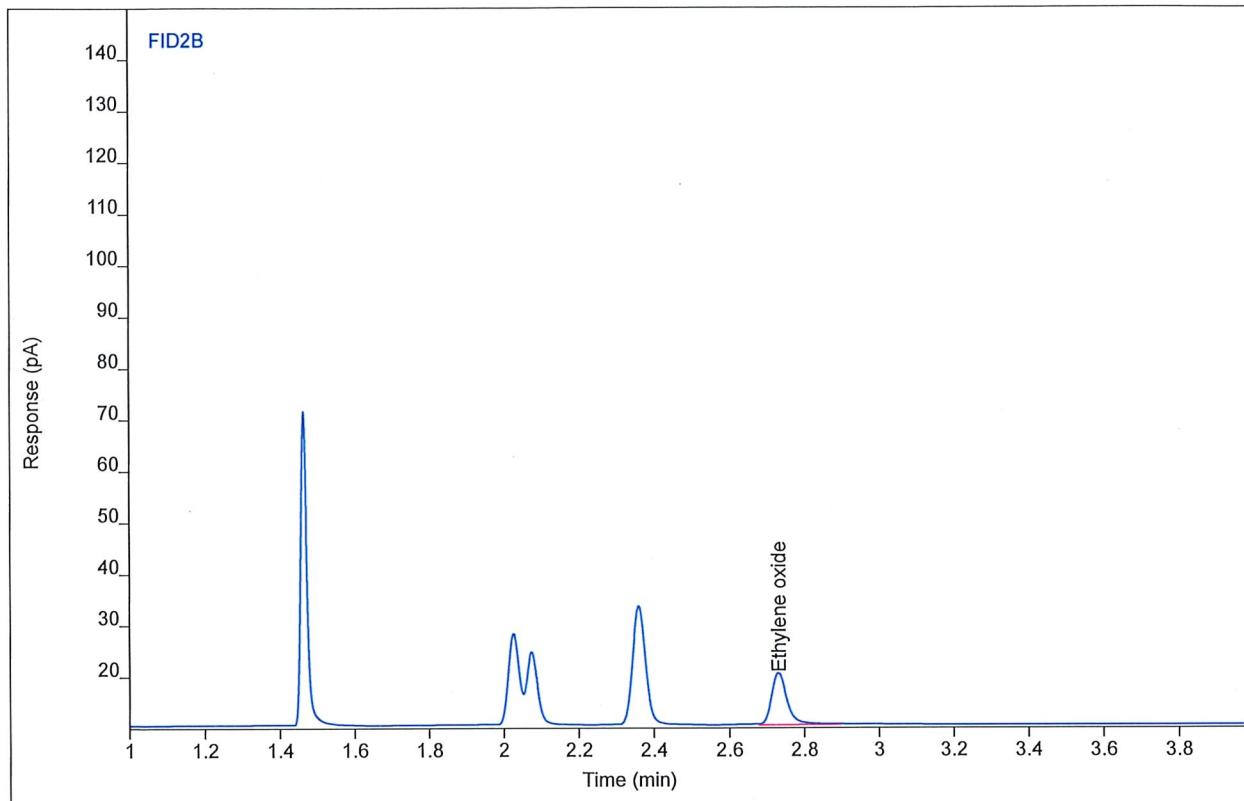
Level 4 : 0.0004

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_001\_025B0102.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 8:41 AM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM

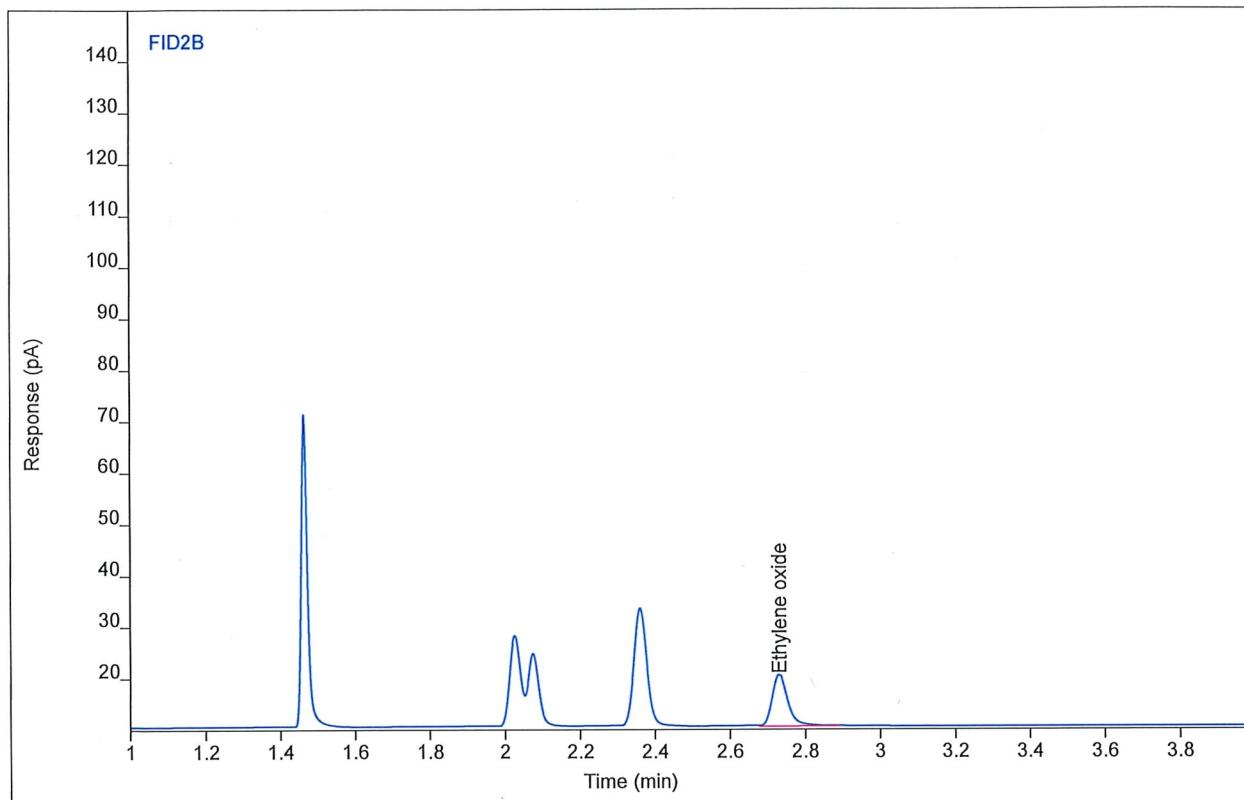


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.9029 | 10.1583 | 81.1218 | 1  | 81.1218 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                   |
|----------------|----------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration       |
| Sequence Name  | Bettyp1038 R1 ver.2              | Vial Number        | Vial 25           |
| Inj Data File  | _002_025B0103.D                  | Injection Volume   | 250               |
| File Location  | GC/2019/Rosie/Quarter 1          | Injection          | 3 of 3            |
| Injection Date | 2/12/2019 9:06 AM                | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/13/2019 9:27 AM                | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                            | Method Modified    | 1/2/2014 5:30 PM  |
| Operator       | Justin Guenzler                  | Printed            | 2/13/2019 9:29 AM |

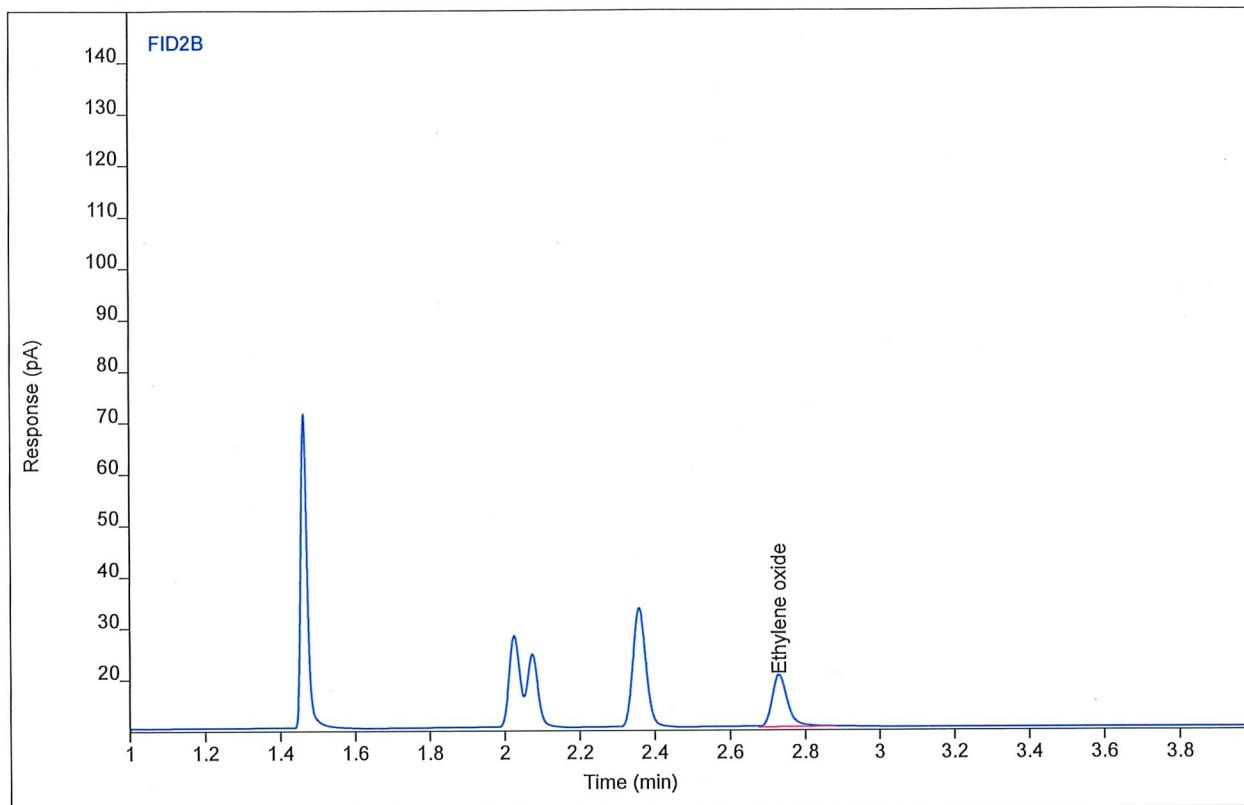


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.7840 | 10.1368 | 80.7917 | 1  | 80.7917 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                   |
|----------------|----------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration       |
| Sequence Name  | Bettyp1038 R1 ver.2              | Vial Number        | Vial 25           |
| Inj Data File  | _003_025B0104.D                  | Injection Volume   | 250               |
| File Location  | GC/2019/Rosie/Quarter 1          | Injection          | 4 of 3            |
| Injection Date | 2/12/2019 9:31 AM                | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/13/2019 9:27 AM                | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                            | Method Modified    | 1/2/2014 5:30 PM  |
| Operator       | Justin Guenzler                  | Printed            | 2/13/2019 9:29 AM |



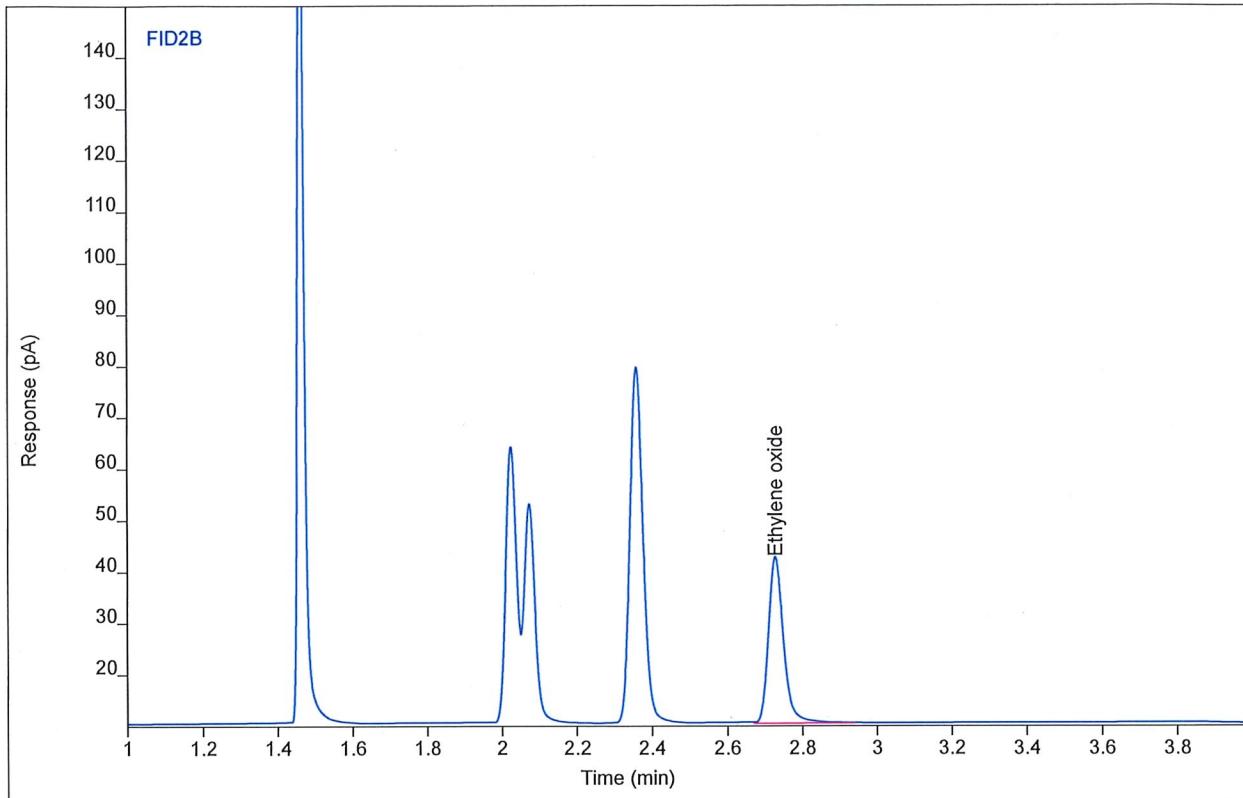
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.8121 | 10.1781 | 80.8695 | 1  | 80.8695 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_004\_025B0302.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 11:58 AM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM



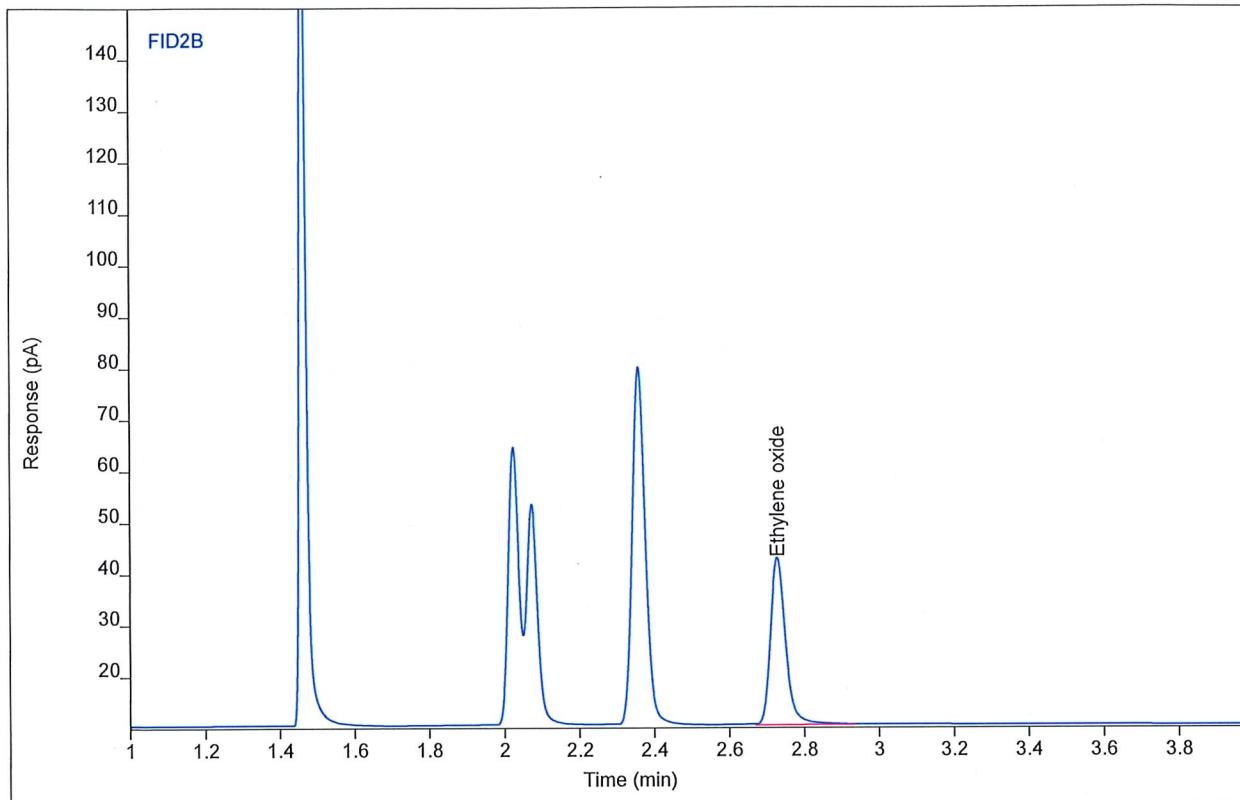
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 90.1178 | 32.3753 | 251.060 | 1  | 251.060 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_005\_025B0303.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 12:23 PM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM



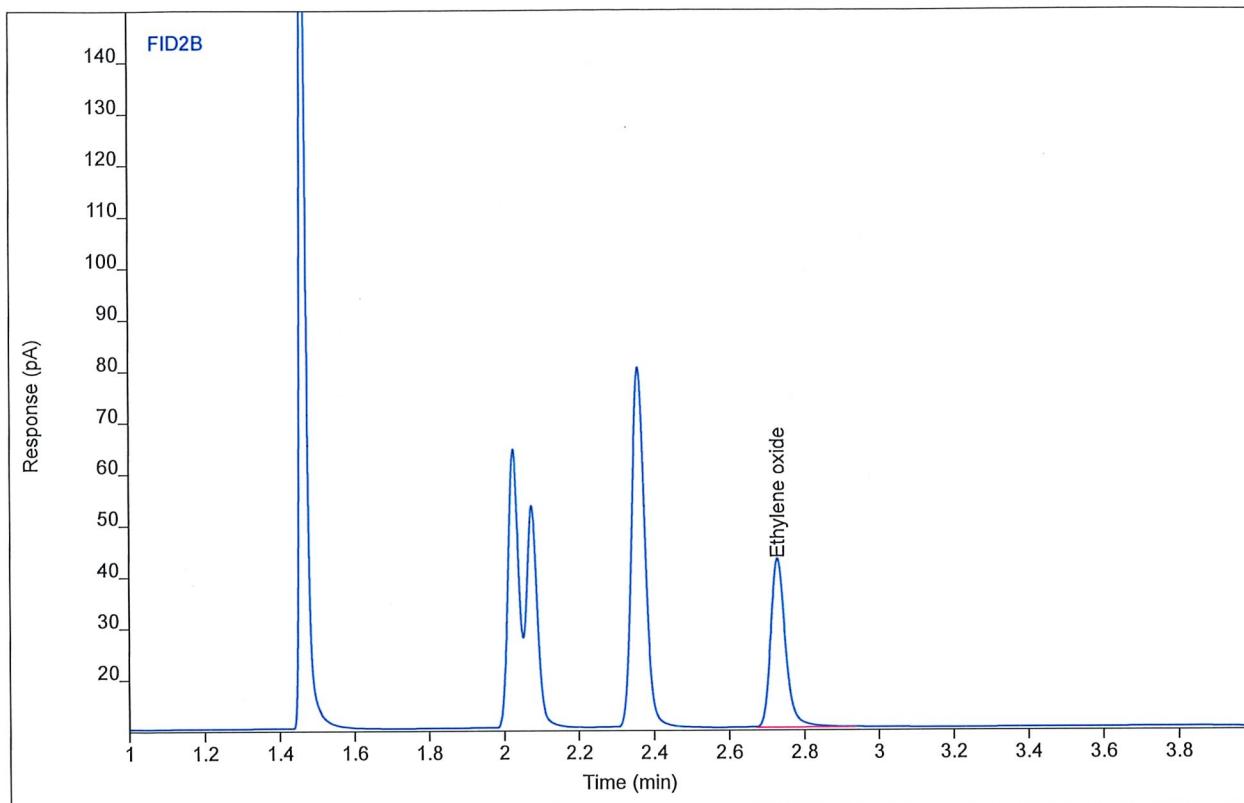
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 90.8804 | 32.5749 | 253.177 | 1  | 253.177 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_006\_025B0304.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 12:47 PM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM



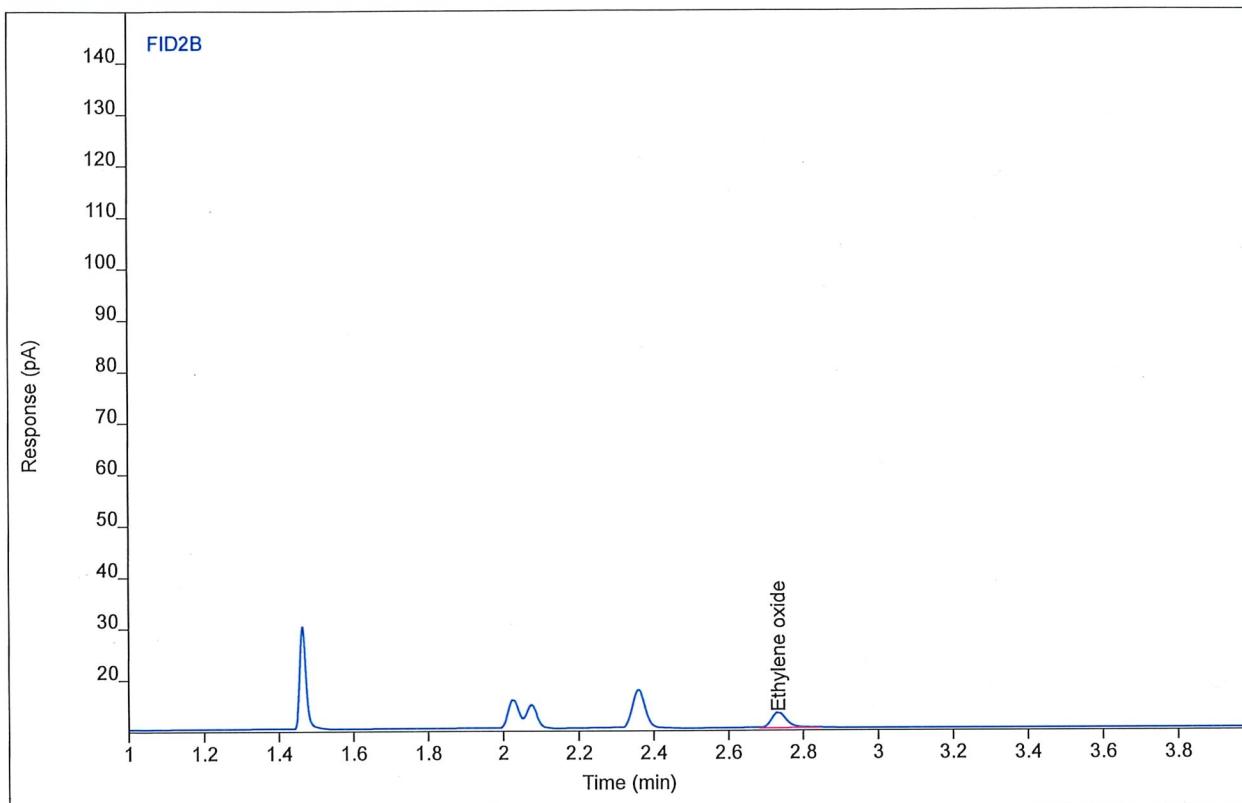
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 91.1803 | 32.8261 | 254.009 | 1  | 254.009 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_007\_025B0402.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 1:36 PM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM



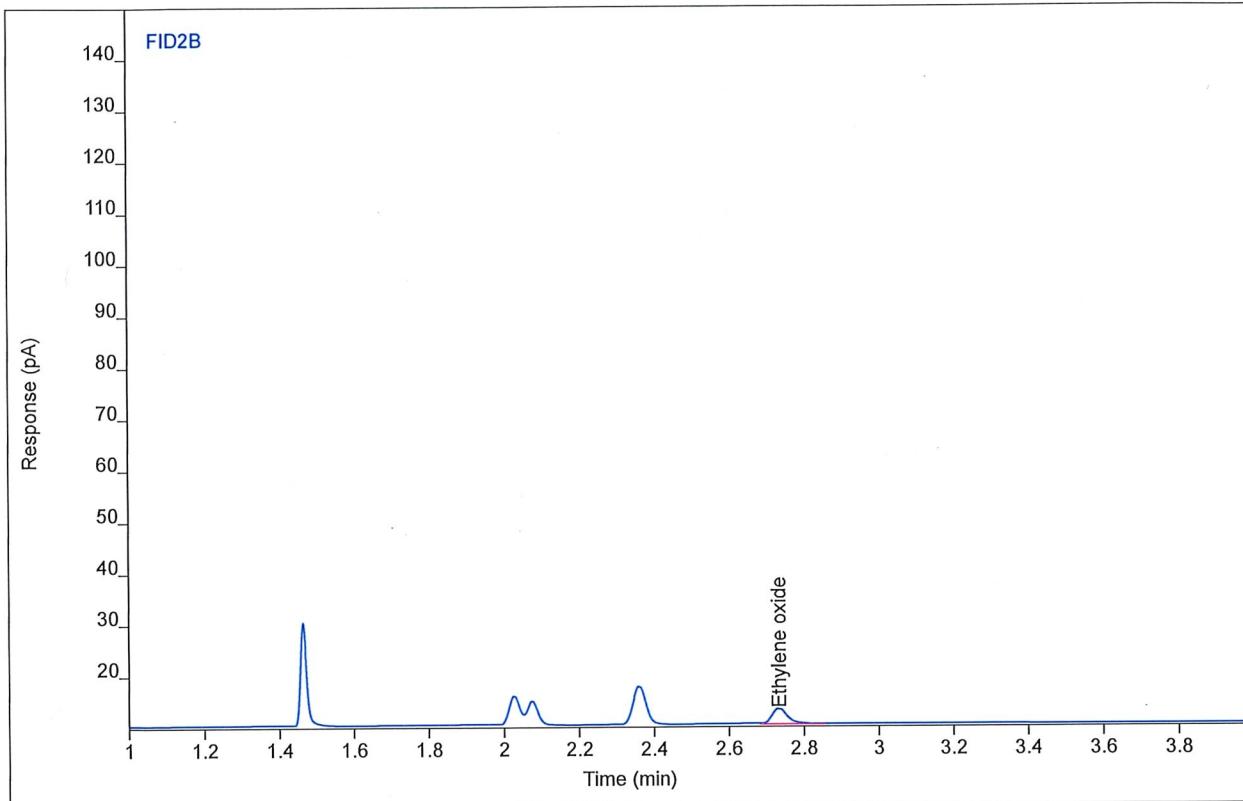
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.71569 | 3.07744 | 25.0802 | 1  | 25.0802 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_008\_025B0403.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 2:01 PM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM



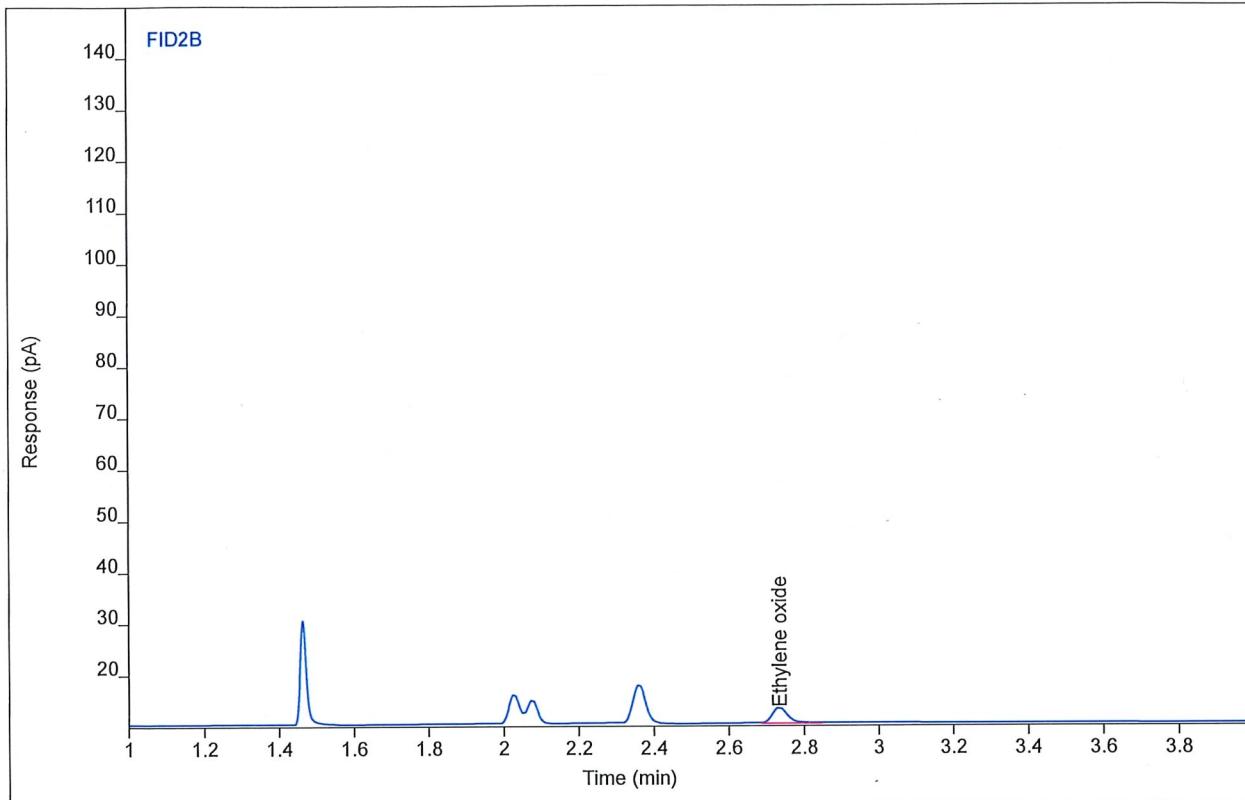
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.77991 | 3.09600 | 25.2584 | 1  | 25.2584 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name Bettyp1038 R1 ver.2  
Inj Data File \_009\_025B0404.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/12/2019 2:25 PM  
File Modified 2/13/2019 9:27 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:29 AM

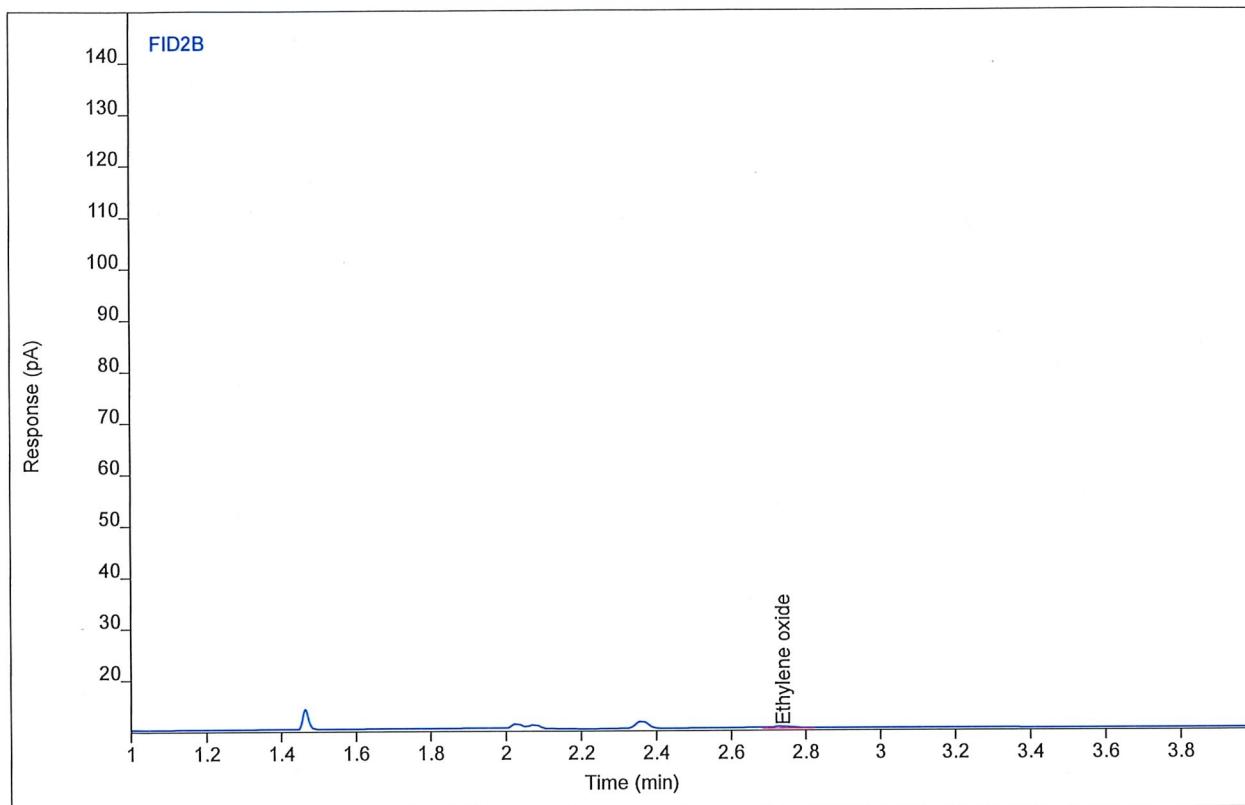


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.75797 | 3.10324 | 25.1975 | 1  | 25.1975 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                   |
|----------------|--------------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration       |
| Sequence Name  | Bettyp1038 R1 ver.2                  | Vial Number        | Vial 25           |
| Inj Data File  | _010_025B0502.D                      | Injection Volume   | 250               |
| File Location  | GC/2019/Rosie/Quarter 1              | Injection          | 2 of 3            |
| Injection Date | 2/12/2019 3:15 PM                    | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/13/2019 9:27 AM                    | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                                | Method Modified    | 1/2/2014 5:30 PM  |
| Operator       | Justin Guenzler                      | Printed            | 2/13/2019 9:29 AM |

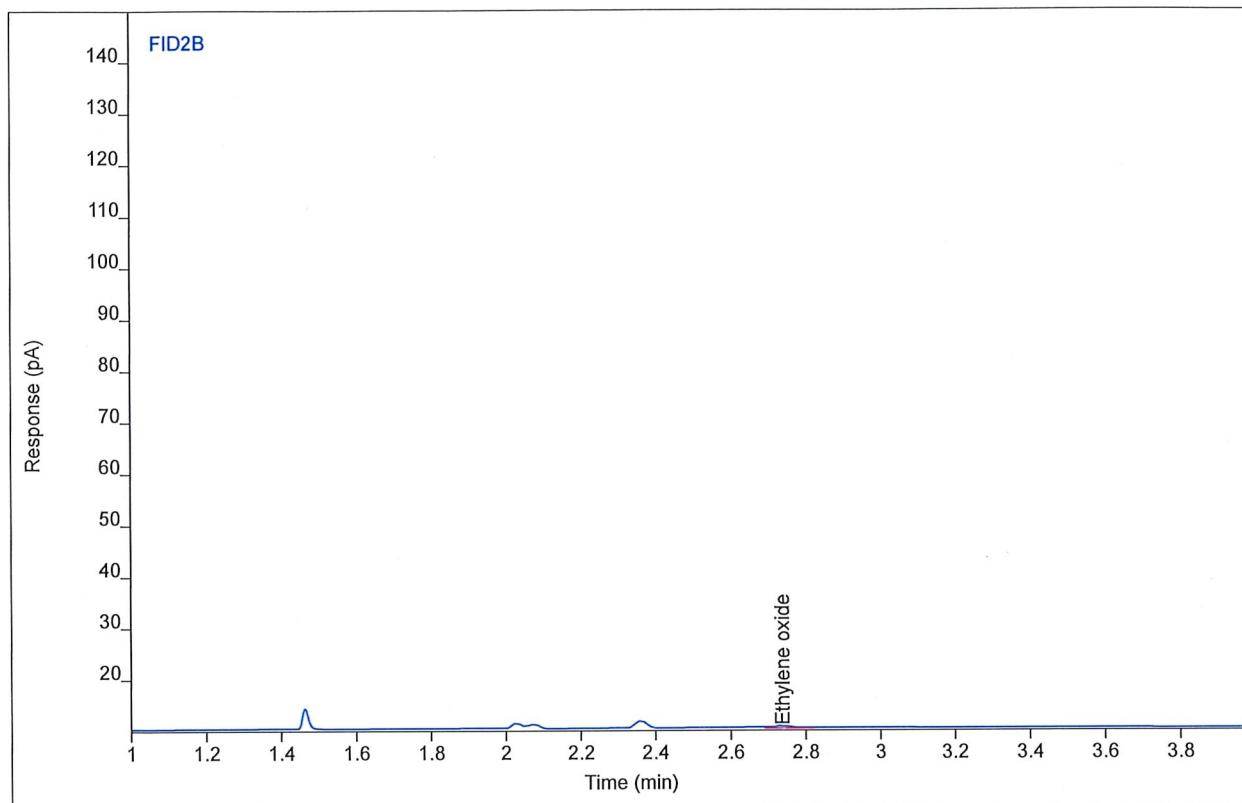


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.55800 | 0.53037 | 5.20978 | 1  | 5.20978 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                   |
|----------------|--------------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration       |
| Sequence Name  | Bettyp1038 R1 ver.2                  | Vial Number        | Vial 25           |
| Inj Data File  | _011_025B0503.D                      | Injection Volume   | 250               |
| File Location  | GC/2019/Rosie/Quarter 1              | Injection          | 3 of 3            |
| Injection Date | 2/12/2019 3:40 PM                    | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/13/2019 9:27 AM                    | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                                | Method Modified    | 1/2/2014 5:30 PM  |
| Operator       | Justin Guenzler                      | Printed            | 2/13/2019 9:29 AM |

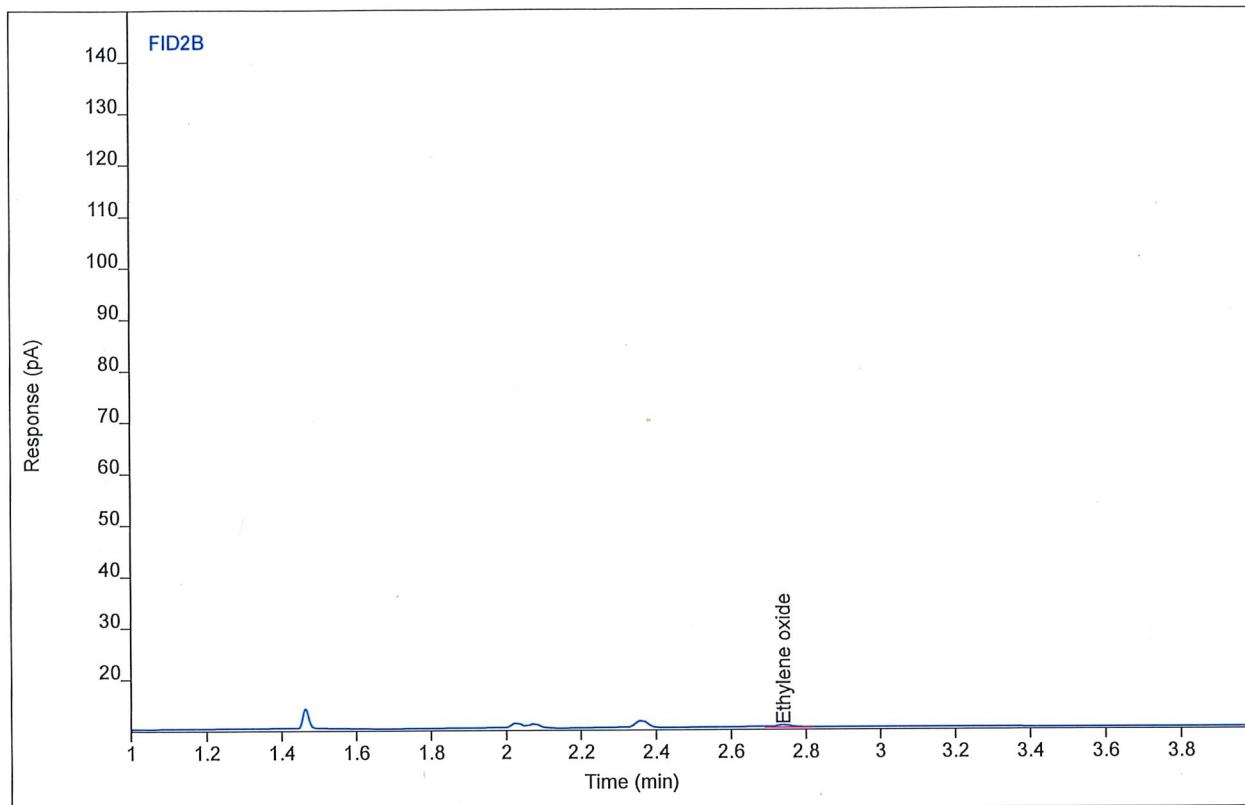


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.52873 | 0.52595 | 5.12852 | 1  | 5.12852 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                   |
|----------------|--------------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration       |
| Sequence Name  | BettyP1038 R1 ver.2                  | Vial Number        | Vial 25           |
| Inj Data File  | _012_025B0504.D                      | Injection Volume   | 250               |
| File Location  | GC/2019/Rosie/Quarter 1              | Injection          | 4 of 3            |
| Injection Date | 2/12/2019 4:04 PM                    | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/13/2019 9:27 AM                    | Analysis Method    | BETTYP1038_EO.M   |
| Instrument     | Betty                                | Method Modified    | 1/2/2014 5:30 PM  |
| Operator       | Justin Guenzler                      | Printed            | 2/13/2019 9:29 AM |



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.50002 | 0.52024 | 5.03394 | 1  | 5.03394 | ppm  |

THE LINDE GROUP



**SHIPPED TO:** Enthalpy Analytical Inc.  
3211 Bramer Drive  
Raleigh , NC 27604

**PAGE:** 1 of 1

### CERTIFICATE OF ANALYSIS

|                     |                |                      |                  |
|---------------------|----------------|----------------------|------------------|
| Sales#:             | 116533174      | Cylinder Size:       | 152 (8" X 47.5") |
| Production#:        | 1460819        | Cylinder # :         | CC-314745        |
| Certification Date: | Jul-13-2018    | Cylinder Pressure:   | 2000 psig        |
| P.O.# :             | PO1022200      | Cylinder Valve:      | CGA 350 / Steel  |
| Blend Type:         | CERTIFIED      | Cylinder Volume:     | 29.5 Liter       |
| Material#:          | 24102763       | Cylinder Material:   | Aluminum         |
| Traceability:       | NIST by weight | Gas Volume:          | 4000 Liters      |
| Expiration Date:    | Jul-13-2019    | Blend Tolerance:     | 5% Relative      |
| Do NOT use under:   | 150 psig       | Analytical Accuracy: | 2% Relative      |

| COMPONENT          | CAS NUMBER | REQUESTED CONC | CERTIFIED CONC |
|--------------------|------------|----------------|----------------|
| Acetylene          | 74-86-2    | 250 ppm        | 255 ppm        |
| Chloromethane      | 74-87-3    | 250 ppm        | 255 ppm        |
| Vinyl Chloride     | 75-01-4    | 250 ppm        | 255 ppm        |
| Dimethyl Ether     | 115-10-6   | 250 ppm        | 259 ppm        |
| Ethylene Oxide     | 75-21-8    | 250 ppm        | 256 ppm        |
| Methylene Chloride | 75-09-2    | 250 ppm        | 256 ppm        |
| Cyclohexane        | 110-82-7   | 250 ppm        | 257 ppm        |
| Isooctane          | 540-84-1   | 250 ppm        | 258 ppm        |
| Nitrogen           | 7727-37-9  | Balance        | Balance        |

**ANALYST:** Lou Lorenzetti

Lou Lorenzetti

**DATE:** Jul-13-2018

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED HYDROCARBON**Customer: \*MORRISVILLE , NC\* - MONTROSE ENVIRONMENTAL  
GROUP

Part X02NI99C15ACKW8

Reference Number: 126-400875670-1

Number:

Cylinder CC122424

Cylinder Volume: 114.8 CF

Number:

Laboratory: 124 - LaPorte Mix (SAP) - TX

Cylinder Pressure: 1602 PSIG

Analysis Mar 09, 2017

Valve Outlet: 350

Date:

Lot Number: 126-400875670-1

Expiration Date: Mar 09, 2019

Traceability Statement: Hydrocarbon Process standards are NIST traceable either directly by weight or by comparison to Airgas laboratory standards that are directly NIST traceable by weight.

**CERTIFIED CONCENTRATIONS**

| Component      | Requested Concentration | Reported Volume % | Accuracy |
|----------------|-------------------------|-------------------|----------|
| ETHYLENE OXIDE | 250.0 PPM               | 242.6 PPM         | +/- 2%   |
| NITROGEN       | 99.98 %                 | 99.97574 %        | +/- 2%   |

Permanent Notes: MONTROSE ENVIRONMENTAL/ENTHALPY ANALYTICAL

Notes:

RECERTIFICATION

PO # 1007021

MONTROSE ENVIRONMENTAL / ENTHALPY ANALYTICAL

  
Approved for Release

Page 1 of 126-400875670-1

## 6890 GC METHOD

## OVEN

Initial temp: 40 C (On)  
 Initial time: 6.00 min  
 Ramps:  
 # Rate Final temp Final time CRYO (N2)  
 1 30.00 220 2.00 Cryo: Off  
 2 0 (Off) Cryo fault: On  
 Post temp: 40 C Cryo timeout: 40.00 min (On)  
 Post time: 0.00 min Quick cryo cool: Off  
 Run time: 14.00 min Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.6 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.6 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 5/5/2014 at 7:51:02 AM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint         |
|------------|------------------------------|
| 3.00       | Front Detector Polarity: Off |

=====  
6890 GC METHOD  
=====

OVEN

Initial temp: 40 C (On) Maximum temp: 250 C  
Initial time: 3.00 min Equilibration time: 0.50 min  
Ramps:  
# Rate Final temp Final time CRYO (N2)  
1 0 (Off) Cryo: Off  
Post temp: 40 C Cryo fault: On  
Post time: 0.00 min Cryo timeout: 40.00 min (On)  
Run time: 3.00 min Quick cryo cool: Off  
Ambient temp: 30 C

FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
Initial temp: 200 C (On)  
Pressure: 60.0 psi (On)  
Purge flow: 0.0 mL/min  
Purge time: 0.00 min  
Total flow: 12.3 mL/min  
Gas saver: Off  
Gas type: Helium

BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
Initial temp: 200 C (On)  
Pressure: 11.7 psi (On)  
Split ratio: 5:1  
Split flow: 12.3 mL/min  
Total flow: 17.6 mL/min  
Gas saver: Off  
Gas type: Helium

COLUMN 1

Packed Column  
Model Number: 19808  
Description: Rt-ShinCarbon 2m x 1mm I  
Max temperature: 250 C  
Mode: constant pressure  
Pressure: 60.0 psi  
Inlet: Front Inlet  
Outlet: Front Detector  
Outlet pressure: ambient

COLUMN 2

Capillary Column  
Model Number: 10198  
Description: Rtx-1 30m x 0.32mm x 4um  
Max temperature: 250 C  
Nominal length: 30.0 m  
Nominal diameter: 320.00 um  
Nominal film thickness: 4.00 um  
Mode: constant flow  
Initial flow: 2.5 mL/min  
Nominal init pressure: 11.7 psi  
Average velocity: 39 cm/sec  
Inlet: Back Inlet  
Outlet: (other)  
Outlet pressure: ambient

FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
Reference flow: 20.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 10.0 mL/min (On)  
Makeup Gas Type: Helium  
Filament: On  
Negative polarity: On

BACK DETECTOR (FID)

Temperature: 250 C (On)  
Hydrogen flow: 60.0 mL/min (On)  
Air flow: 450.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 40.0 mL/min (On)  
Makeup Gas Type: Nitrogen  
Flame: On  
Electrometer: On  
Lit offset: 2.0

SIGNAL 1

Data rate: 20 Hz  
Type: front detector  
Save Data: On

SIGNAL 2

Data rate: 20 Hz  
Type: back detector  
Save Data: On

THERMAL AUX 1

Use: Valve Box Heater  
Initial temp: 130 C (On)

VALVES

Valve 1 Gas Sampling  
Loop Volume: 0.250 mL

POST RUN

Post Time: 0.00 min

dified on: 2/17/2014 at 5:52:35 PM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint |
|------------|----------------------|
|------------|----------------------|

### Calibration Table

Calib. Data Modified : Wednesday, February 13, 2019 6:12:36 AM

Rel. Reference Window : 1.000 %  
Abs. Reference Window : 0.000 min  
Rel. Non-ref. Window : 1.000 %  
Abs. Non-ref. Window : 0.000 min  
Uncalibrated Peaks : using compound Ethylene oxide  
Partial Calibration : Yes, identified peaks are recalibrated  
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear  
Origin : Connected  
Weight : Quadratic (Amnt)

Recalibration Settings:  
Average Response : Average all calibrations  
Average Retention Time: Floating Average New 75%

Calibration Report Options :

- Printout of recalibrations within a sequence:
- Calibration Table after Recalibration
- Normal Report after Recalibration

If the sequence is done with bracketing:

- Results of first cycle (ending previous bracket)

Signal 1: FID2 B,

| RetTime<br>[min] | Lvl<br>Sig | Amount<br>[ppm] | Area     | Amt/Area | Ref Grp | Name           |
|------------------|------------|-----------------|----------|----------|---------|----------------|
| 2.737            | 1          | 5.12000         | 1.60441  | 3.19120  |         | Ethylene oxide |
|                  | 2          | 25.60000        | 9.68536  | 2.64316  |         |                |
|                  | 3          | 78.77000        | 31.49280 | 2.50121  |         |                |
|                  | 4          | 256.00000       | 96.47888 | 2.65343  |         |                |

More compound-specific settings:

Compound: Ethylene oxide Time Window : From 2.691 min To 2.756 min

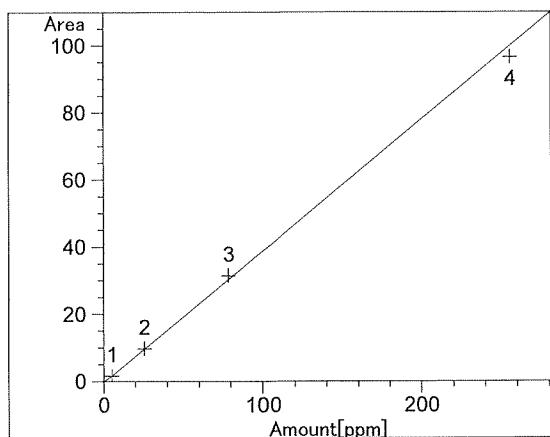
### Peak Sum Table

\*\*\*No Entries in table\*\*\*

=====

Calibration Curves

=====



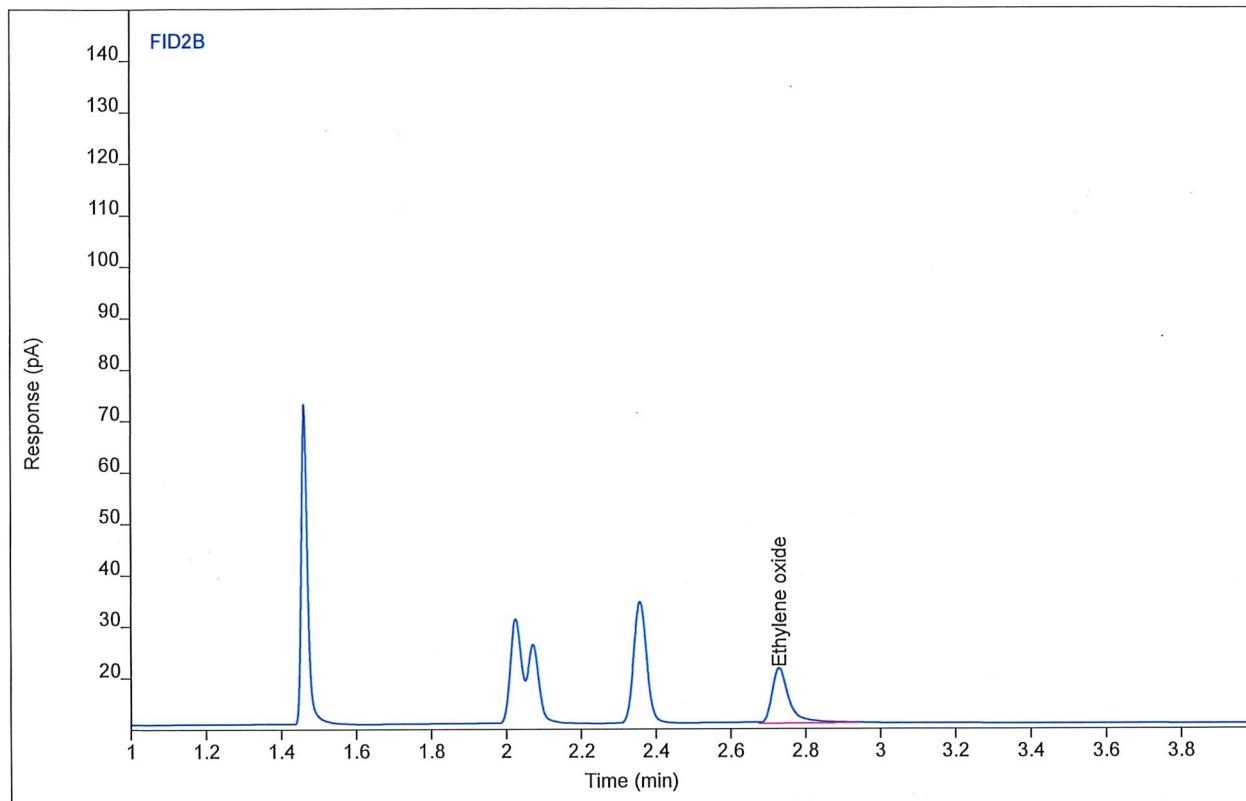
Ethylene oxide at exp. RT: 2.737  
FID2 B,  
Correlation: 0.99952  
Residual Std. Dev.: 2.57379  
Formula:  $y = mx + b$   
m: 3.92090e-1  
b: -3.98386e-1  
x: Amount  
y: Area  
Calibration Level Weights:  
Level 1 : 1  
Level 2 : 0.04  
Level 3 : 0.004225  
Level 4 : 0.0004

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_014\_025B1302.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 12:17 PM  
File Modified 2/13/2019 9:17 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 2 of 16  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM



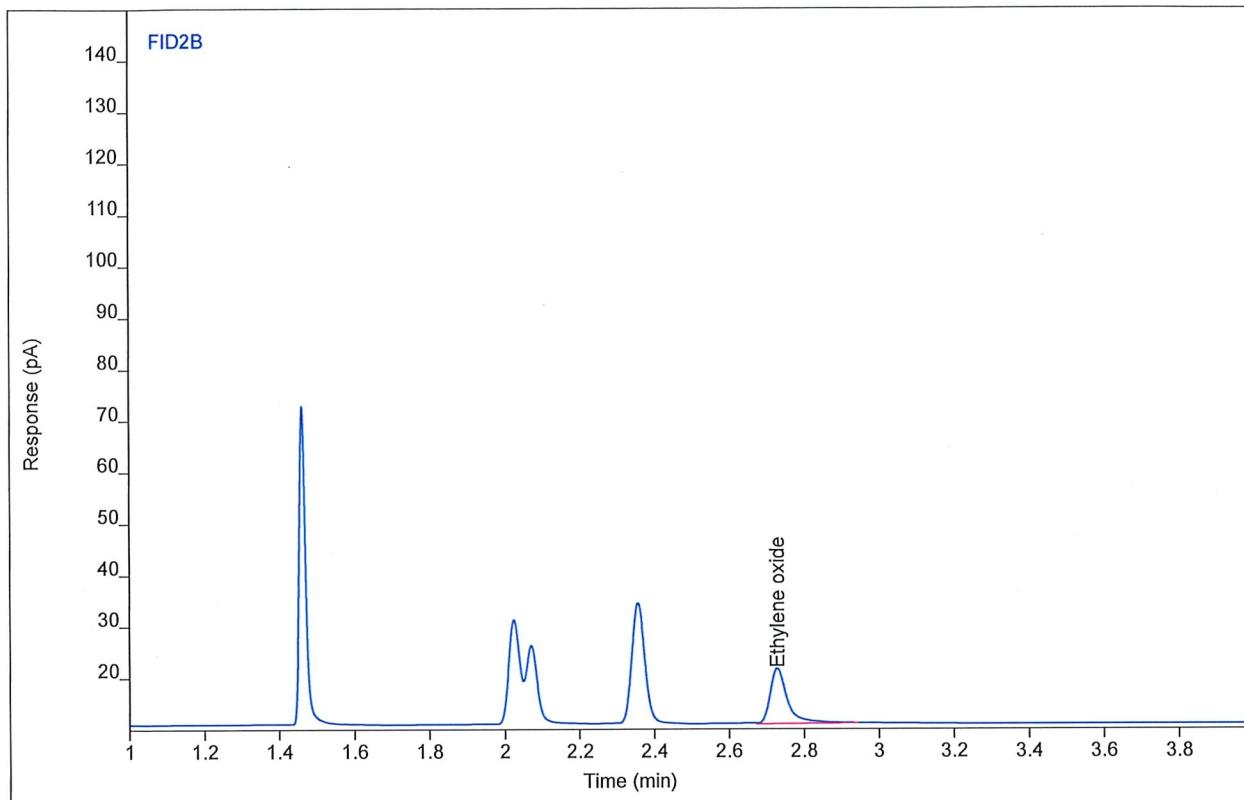
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 34.2866 | 10.8255 | 88.4619 | 1  | 88.4619 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_015\_025B1303.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 12:41 PM  
File Modified 2/13/2019 9:17 AM  
Instrument Betty  
Operator Nicholas Traversa

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 16  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM

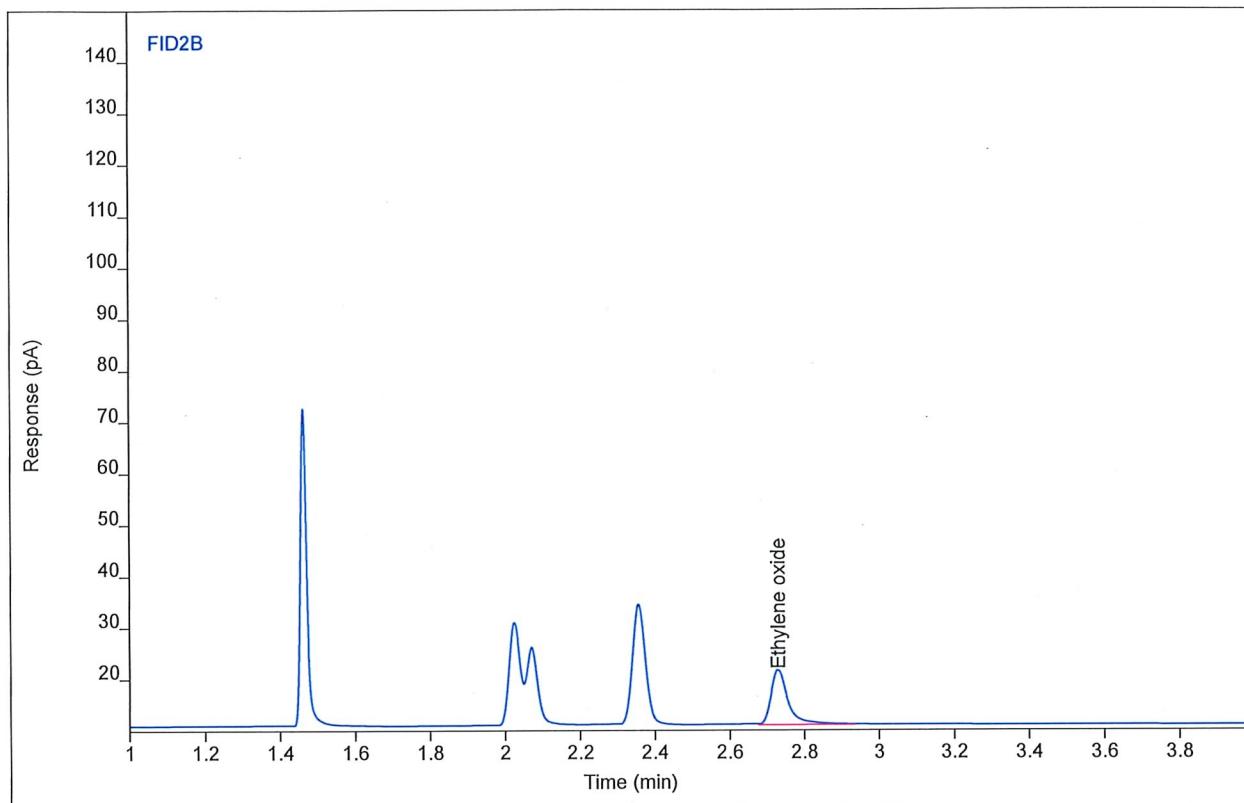


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 34.2721 | 10.8098 | 88.4248 | 1  | 88.4248 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                          |
|----------------|----------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC3 ENV(1=636,6=400) | Sample Type        | Calibration              |
| Sequence Name  | BettyP1033 R1 ver.3              | Vial Number        | Vial 25                  |
| Inj Data File  | _016_025B1304.D                  | Injection Volume   | 250                      |
| File Location  | GC/2019/Rosie/Quarter 1          | Injection          | 4 of 16                  |
| Injection Date | 2/10/2019 1:06 PM                | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/13/2019 9:17 AM                | Analysis Method    | BETTYP1038_EO_COMBINED.M |
| Instrument     | Betty                            | Method Modified    | 1/2/2014 5:30 PM         |
| Operator       | Nicholas Traversa                | Printed            | 2/13/2019 9:22 AM        |



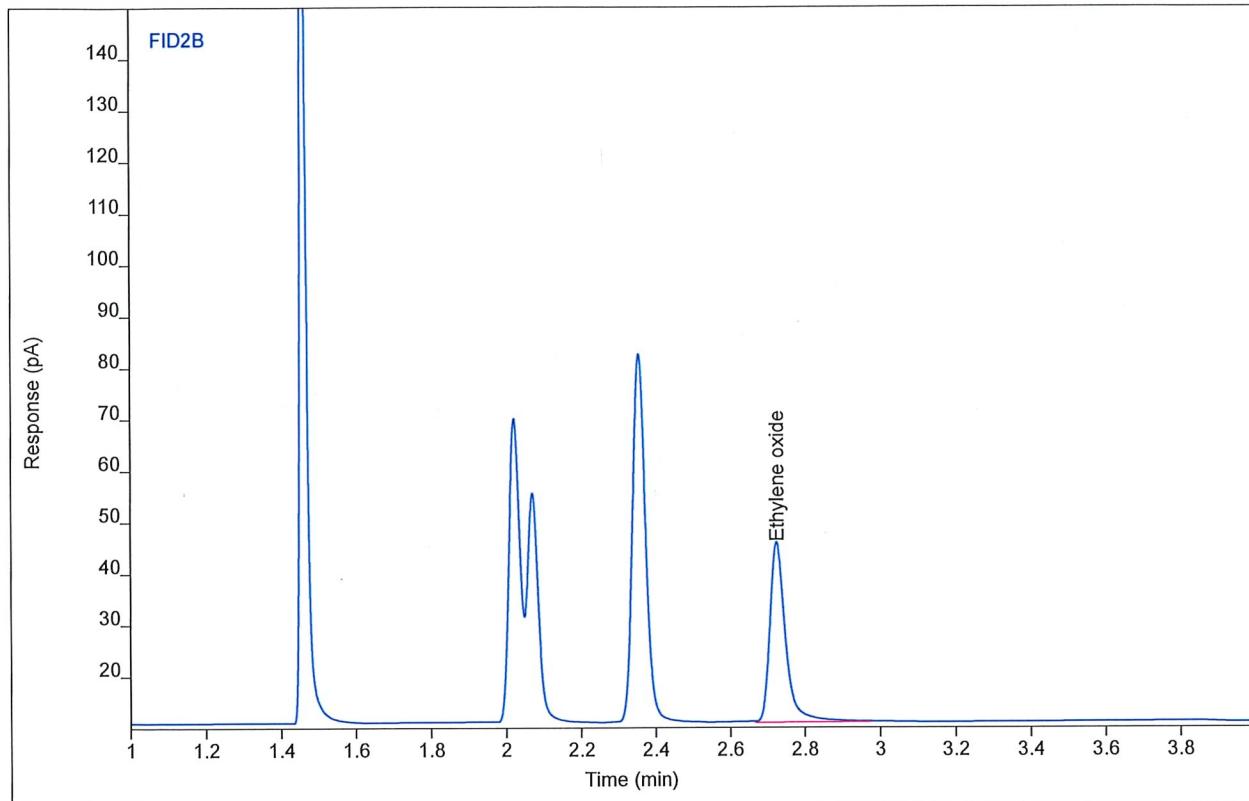
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 33.8990 | 10.7752 | 87.4734 | 1  | 87.4734 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_018\_025B1402.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 1:55 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM



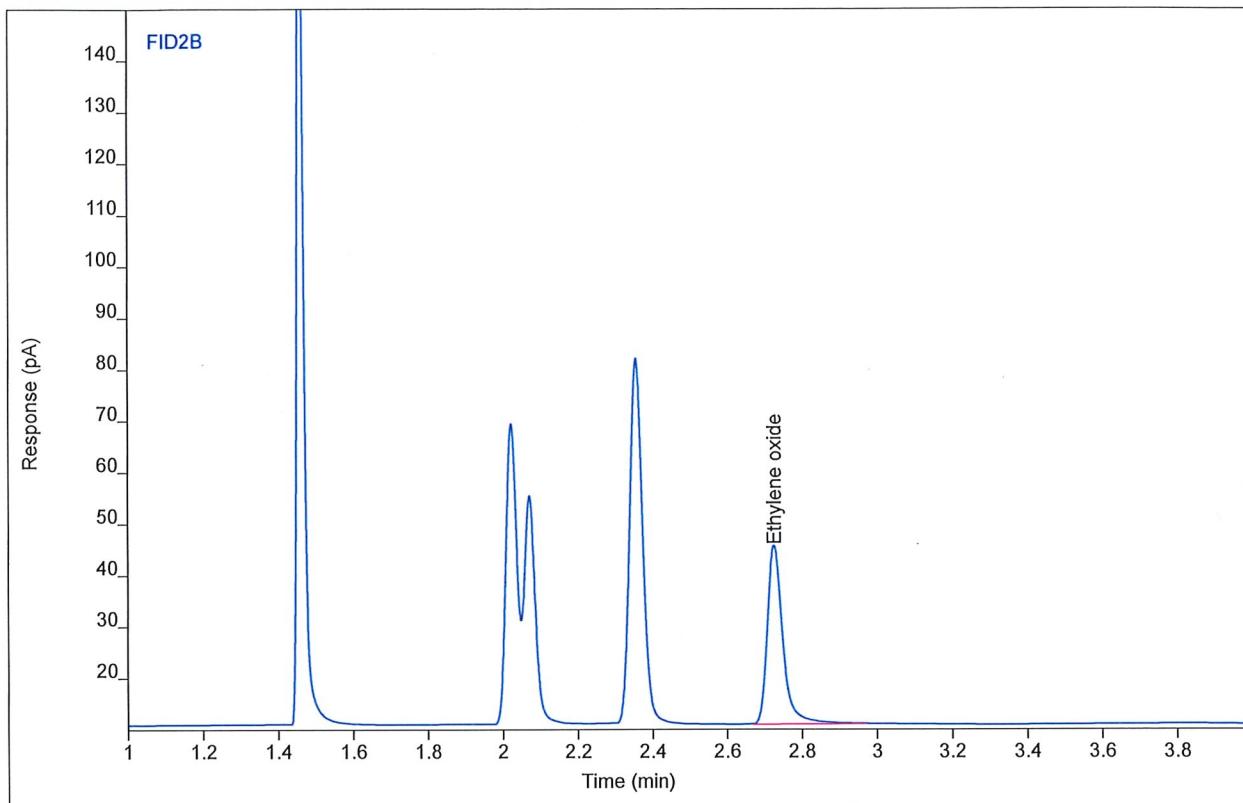
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 103.026 | 35.0330 | 263.778 | 1  | 263.778 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_019\_025B1403.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 2:19 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM



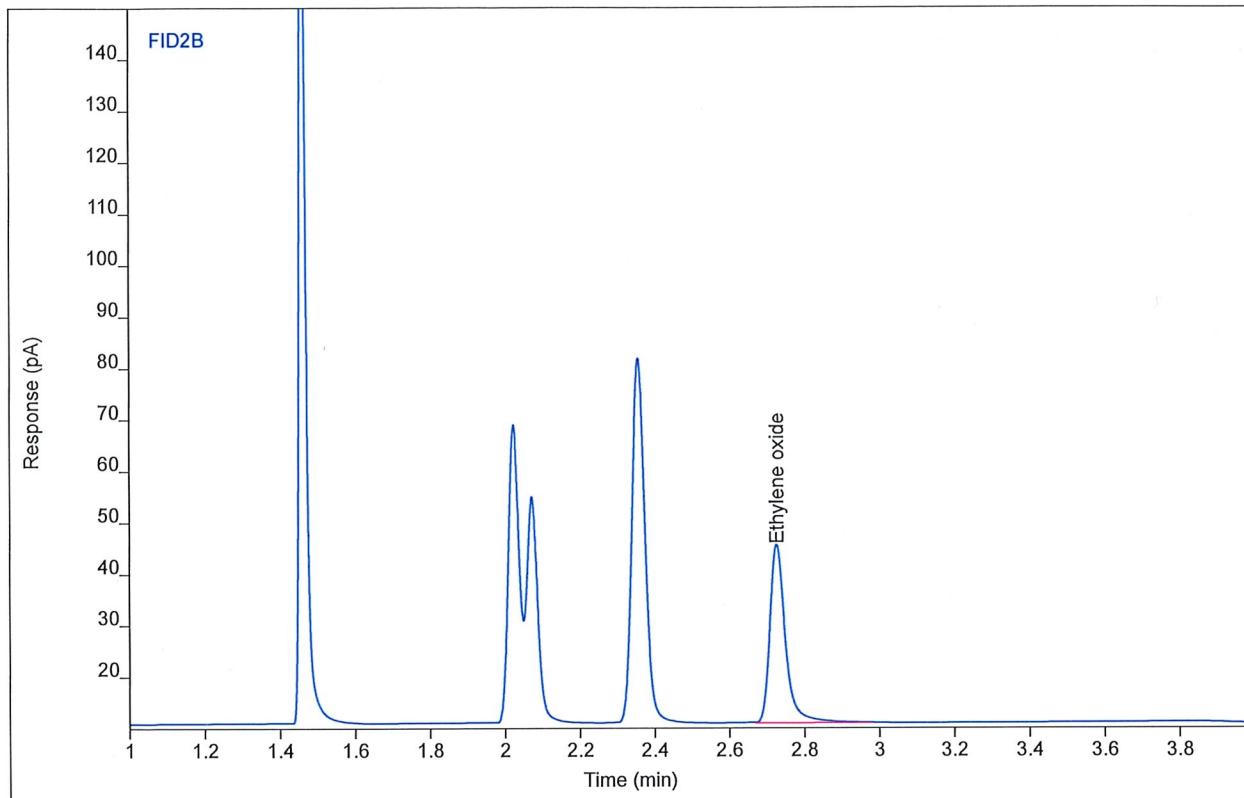
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 102.107 | 34.8520 | 261.432 | 1  | 261.432 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_020\_025B1404.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 2:44 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM



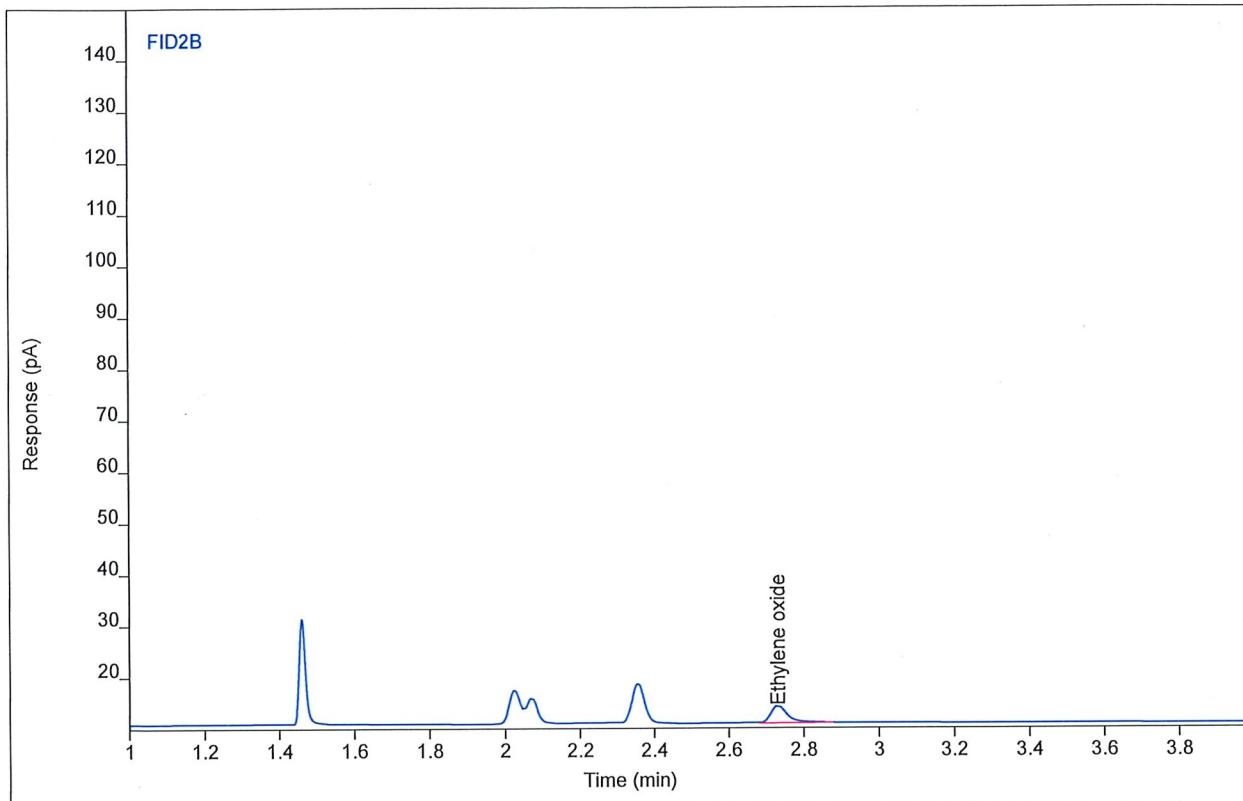
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 101.562 | 34.7635 | 260.043 | 1  | 260.043 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_022\_025B1502.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 3:33 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM

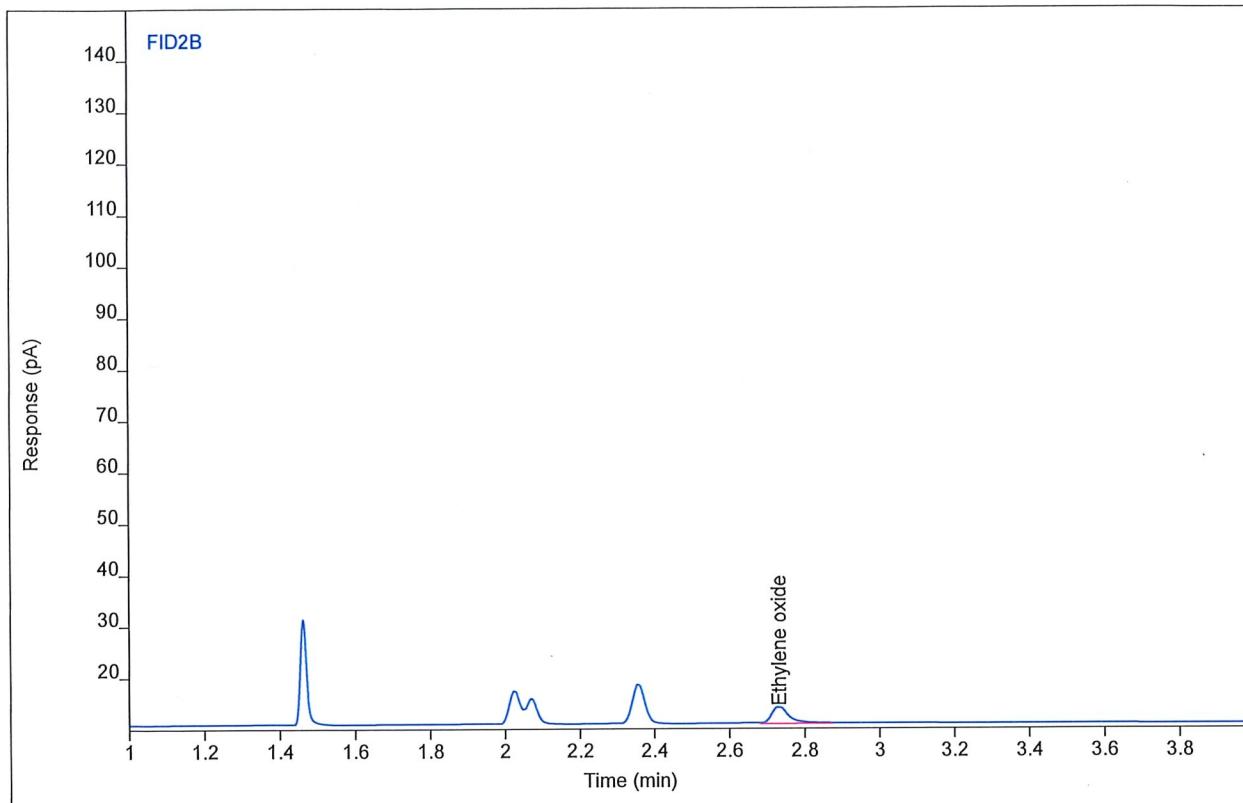


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.6351 | 3.40064 | 28.1402 | 1  | 28.1402 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                  |                    |                          |
|----------------|----------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC2 ENV(1=636,6=100) | Sample Type        | Calibration              |
| Sequence Name  | BettyP1033 R1 ver.3              | Vial Number        | Vial 25                  |
| Inj Data File  | _023_025B1503.D                  | Injection Volume   | 250                      |
| File Location  | GC/2019/Rosie/Quarter 1          | Injection          | 3 of 4                   |
| Injection Date | 2/10/2019 3:58 PM                | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/13/2019 9:18 AM                | Analysis Method    | BETTYP1038_EO_COMBINED.M |
| Instrument     | Betty                            | Method Modified    | 1/2/2014 5:30 PM         |
| Operator       | Nicholas Traversa                | Printed            | 2/13/2019 9:22 AM        |



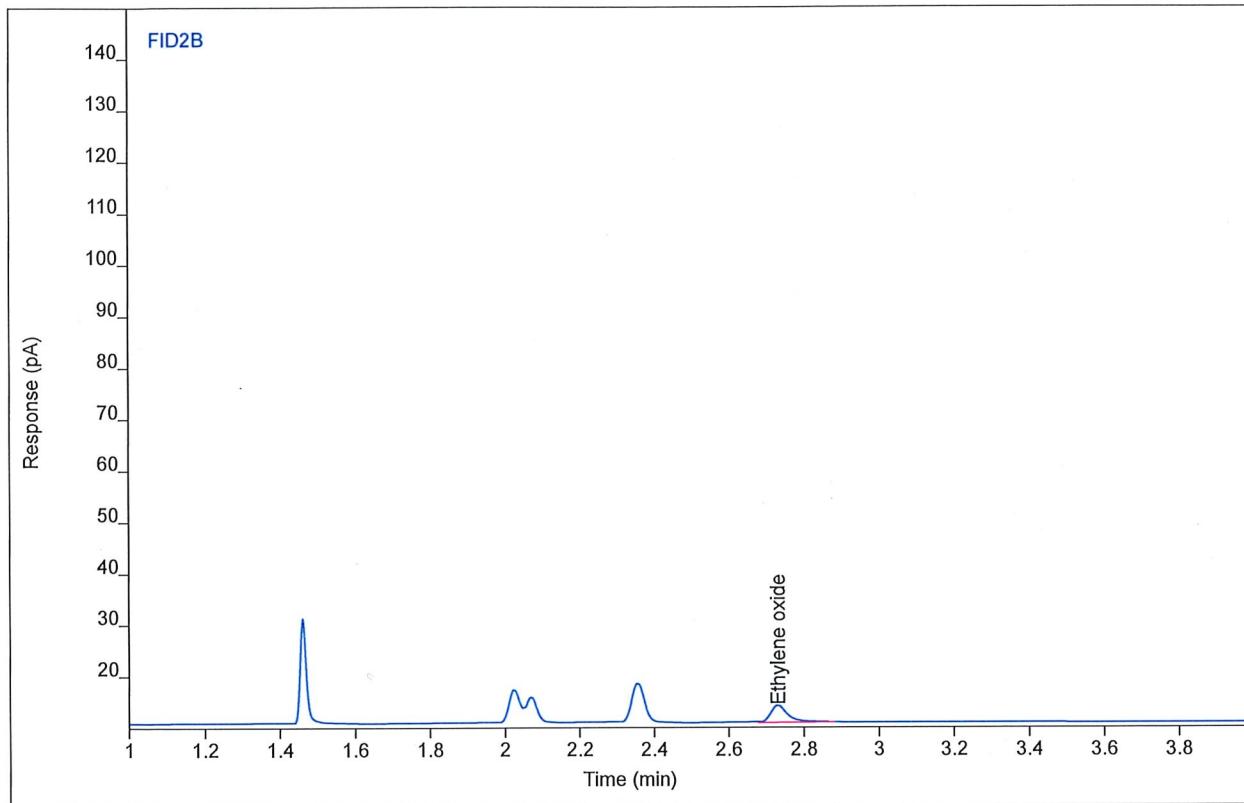
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.5770 | 3.37193 | 27.9921 | 1  | 27.9921 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_024\_025B1504.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 4:22 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM



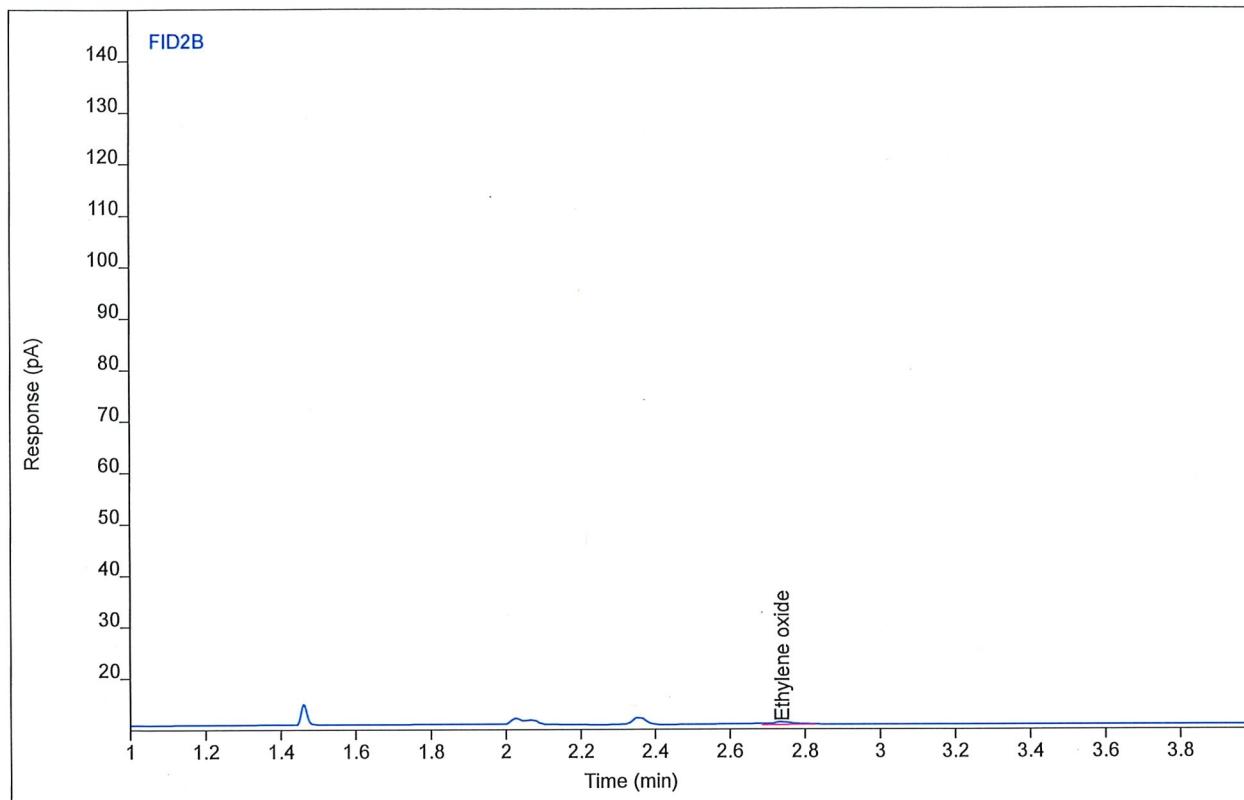
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.6465 | 3.37035 | 28.1692 | 1  | 28.1692 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_026\_025B1602.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 5:11 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

Sample Type Vial Number Calibration  
Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM



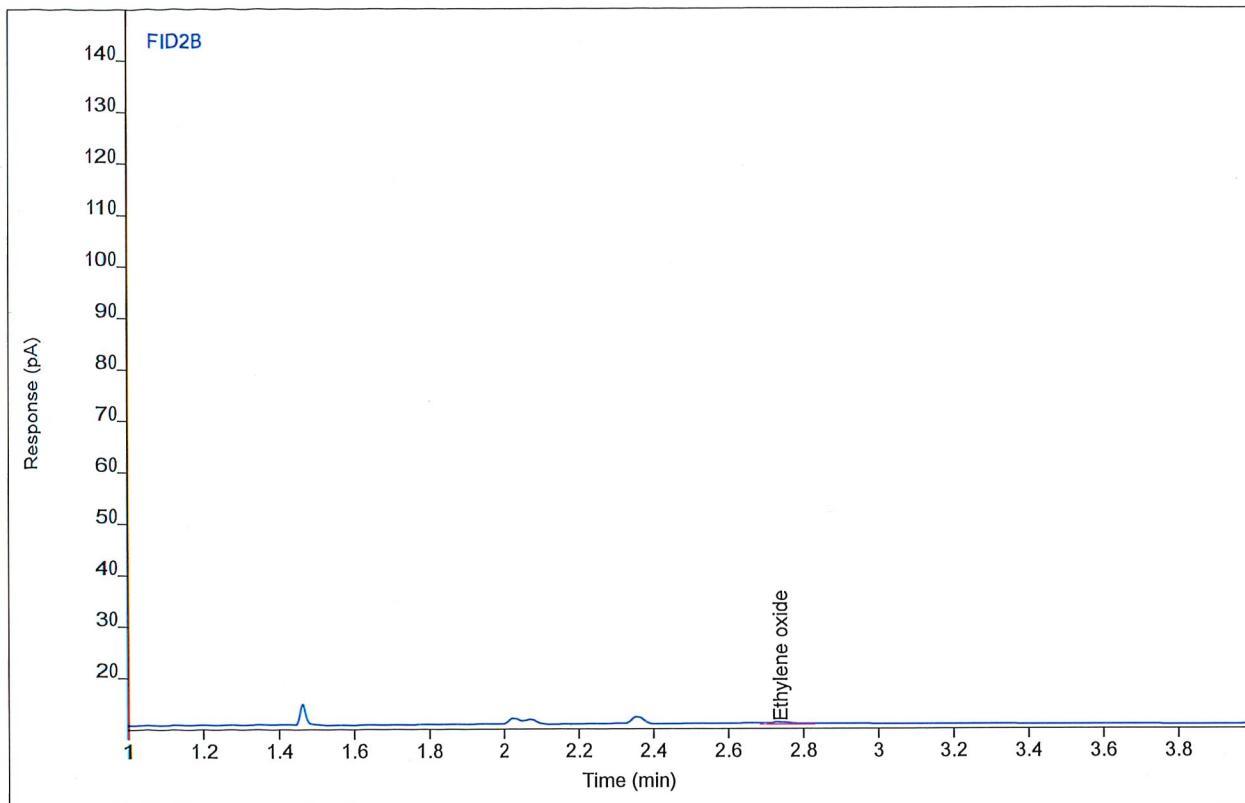
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.72307 | 0.54717 | 5.41064 | 1  | 5.41064 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BettyP1033 R1 ver.3  
Inj Data File \_027\_025B1603.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 5:36 PM  
File Modified 2/13/2019 9:18 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/13/2019 9:22 AM

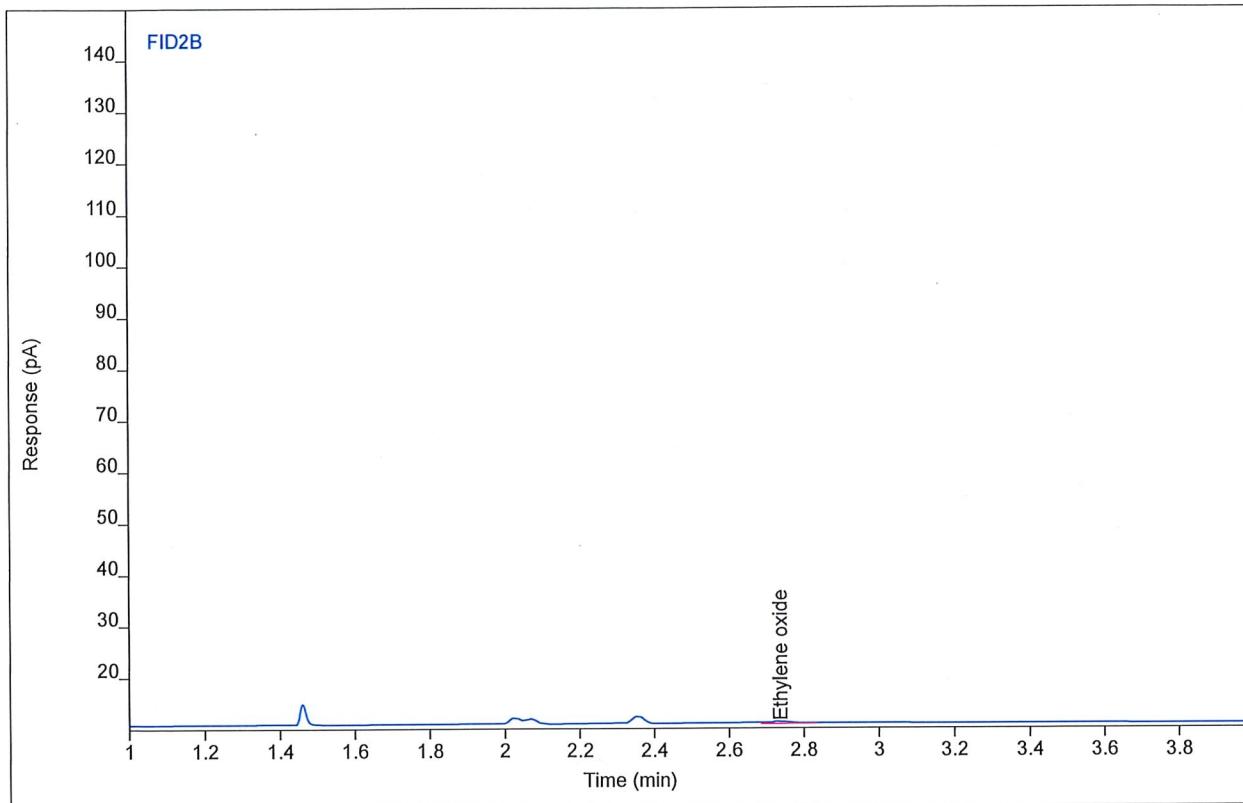


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.67475 | 0.52475 | 5.28740 | 1  | 5.28740 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                          |
|----------------|--------------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration              |
| Sequence Name  | BettyP1033 R1 ver.3                  | Vial Number        | Vial 25                  |
| Inj Data File  | _028_025B1604.D                      | Injection Volume   | 250                      |
| File Location  | GC/2019/Rosie/Quarter 1              | Injection          | 4 of 4                   |
| Injection Date | 2/10/2019 6:01 PM                    | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/13/2019 9:18 AM                    | Analysis Method    | BETTYP1038_EO_COMBINED.M |
| Instrument     | Betty                                | Method Modified    | 1/2/2014 5:30 PM         |
| Operator       | Nicholas Traversa                    | Printed            | 2/13/2019 9:22 AM        |



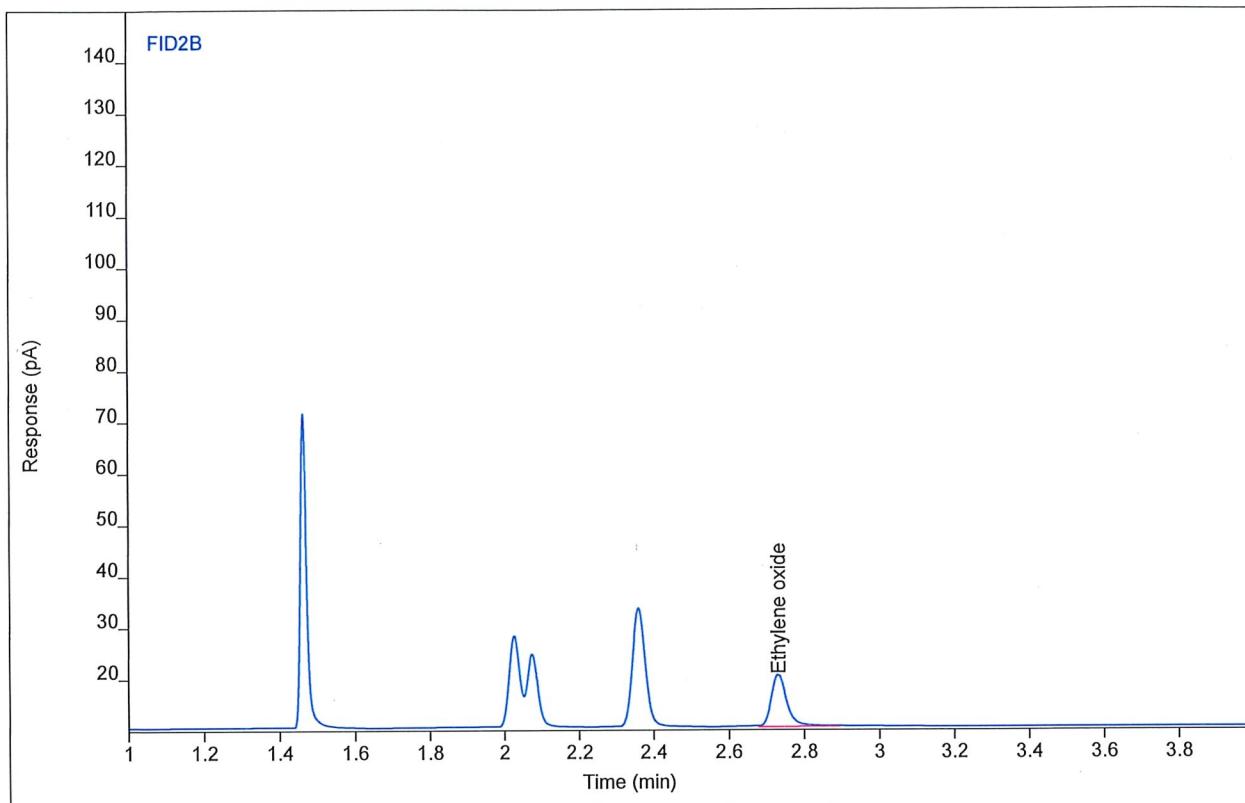
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.64190 | 0.52322 | 5.20362 | 1  | 5.20362 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0102.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 8:41 AM  
File Modified 2/13/2019 8:51 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



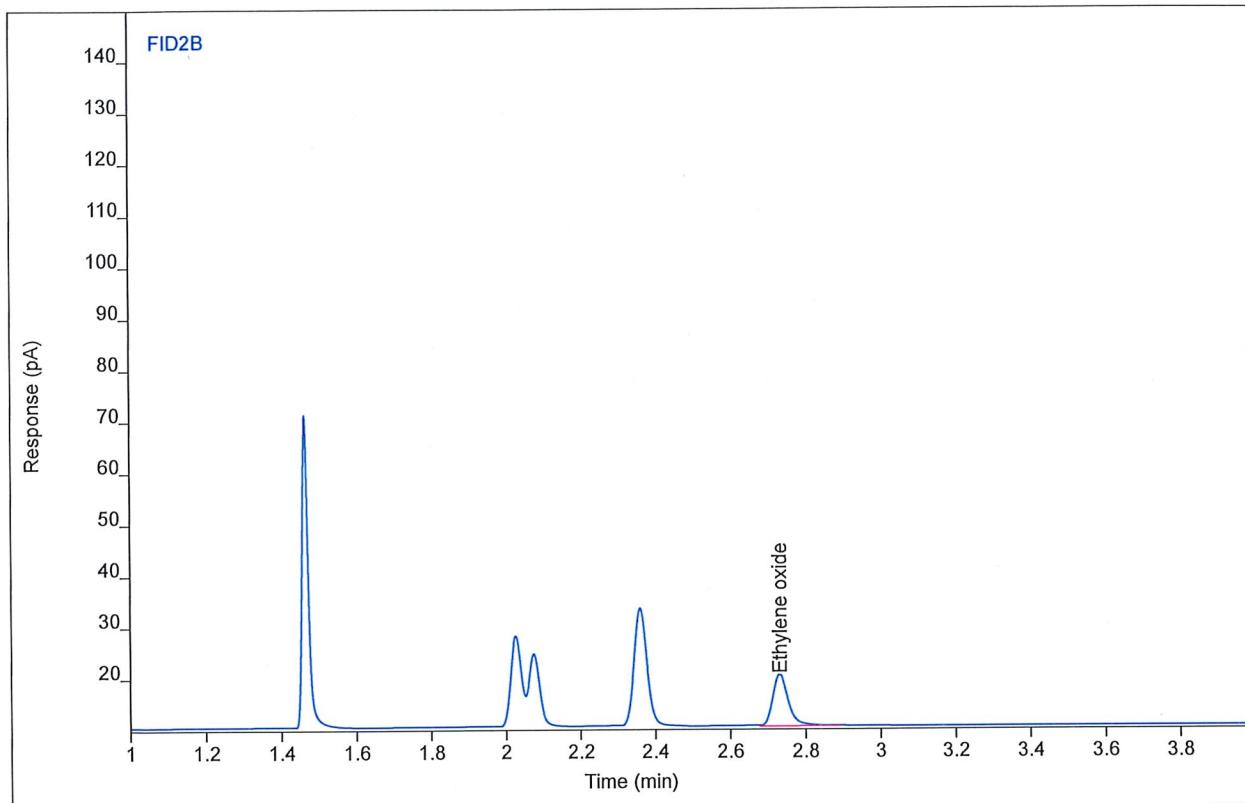
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.9029 | 10.1583 | 74.7312 | 1  | 74.7312 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0103.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 9:06 AM  
File Modified 2/13/2019 8:51 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



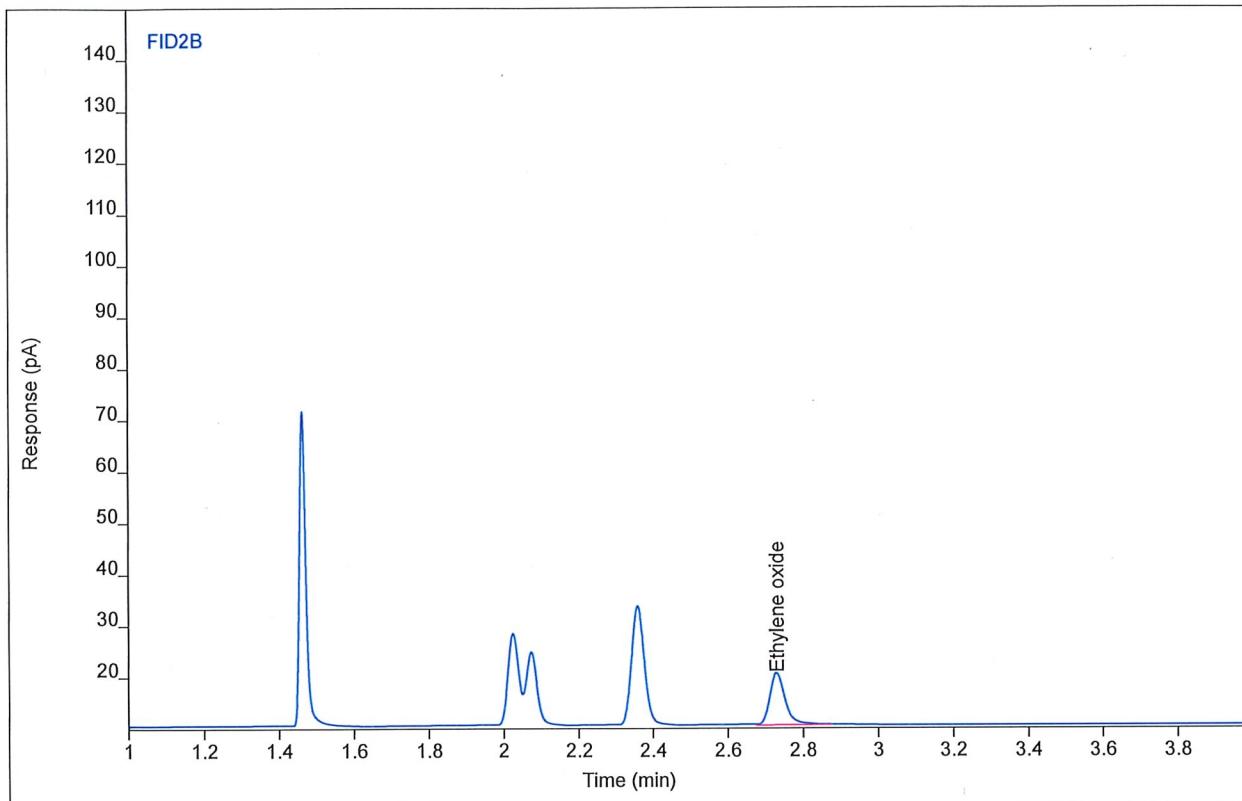
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.7840 | 10.1368 | 74.4279 | 1  | 74.4279 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0104.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 9:31 AM  
File Modified 2/13/2019 8:51 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



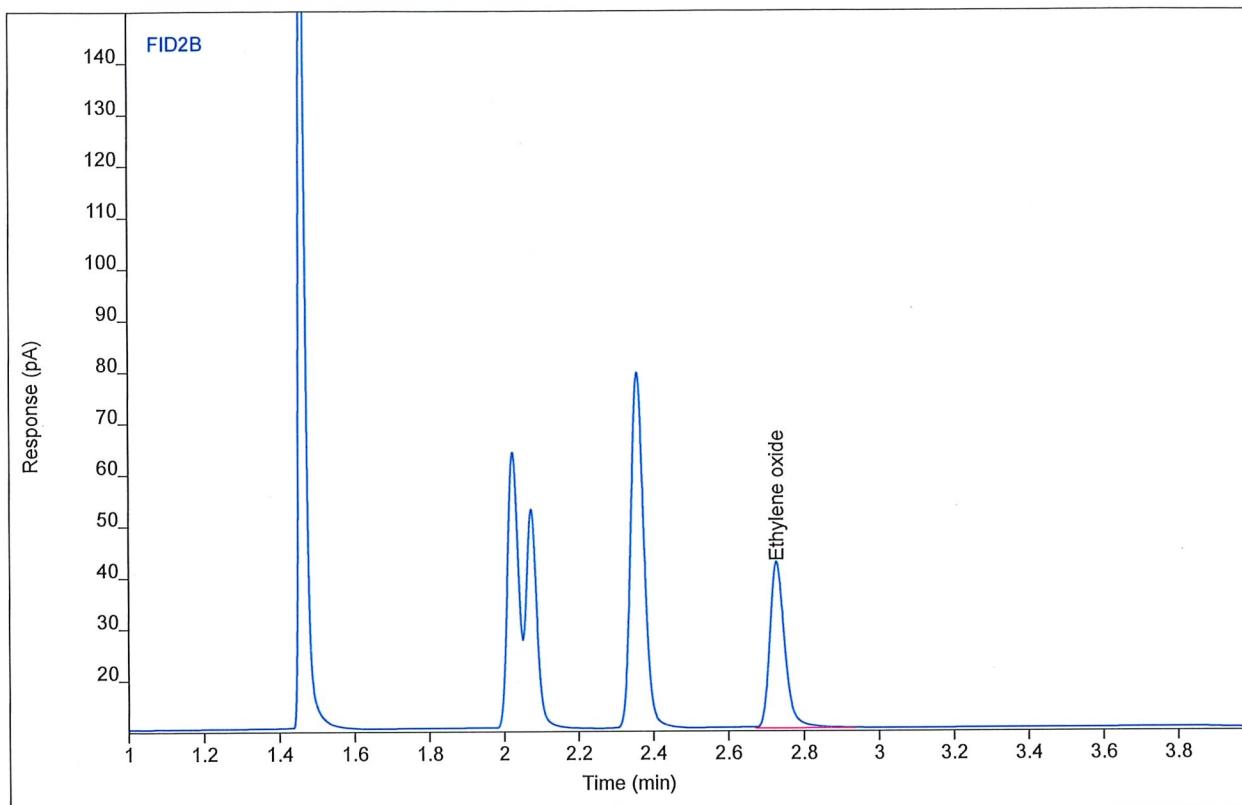
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 28.8121 | 10.1781 | 74.4994 | 1  | 74.4994 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 11:58 AM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial Number Calibration  
Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



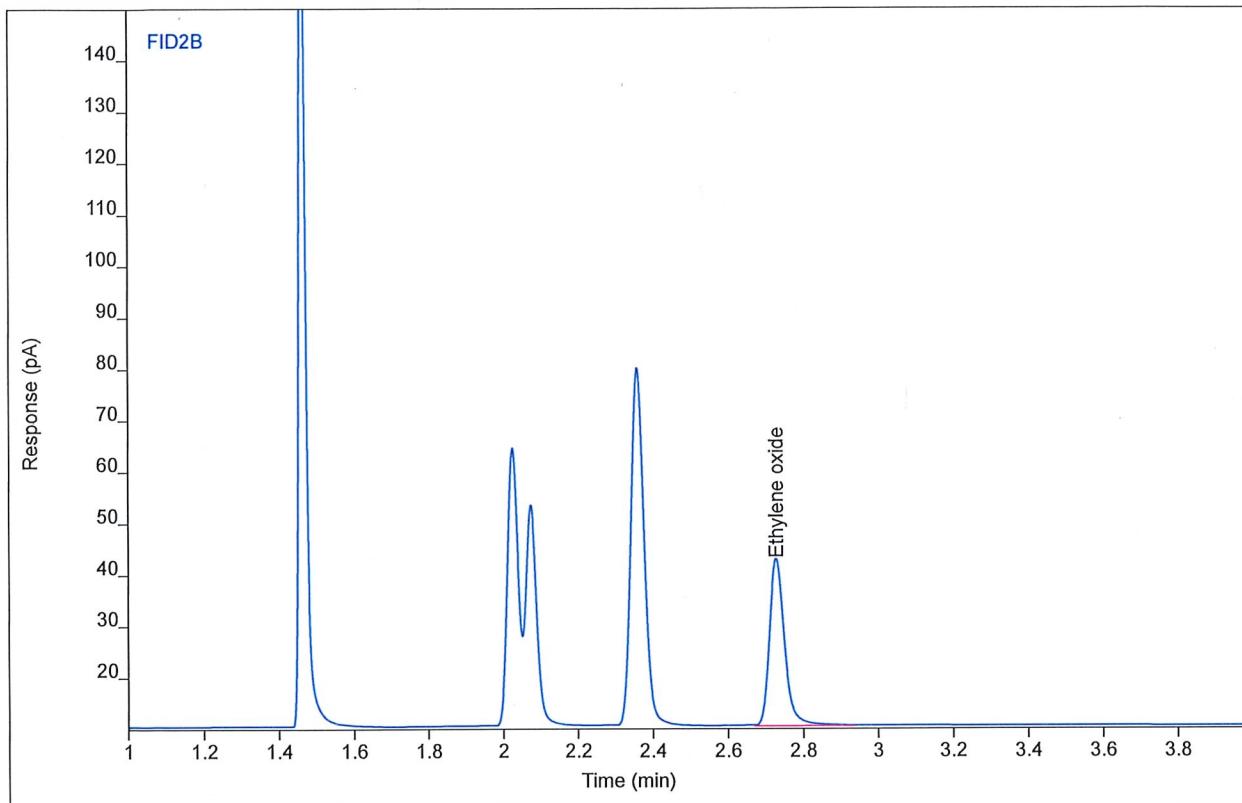
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 90.1178 | 32.3753 | 230.856 | 1  | 230.856 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 12:23 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection GC142P133\_CAL.M  
Acquisition Method BETTYP1038\_EO\_COMBINED.M  
Analysis Method 2/13/2019 6:17 AM  
Method Modified 2/13/2019 9:22 AM  
Printed



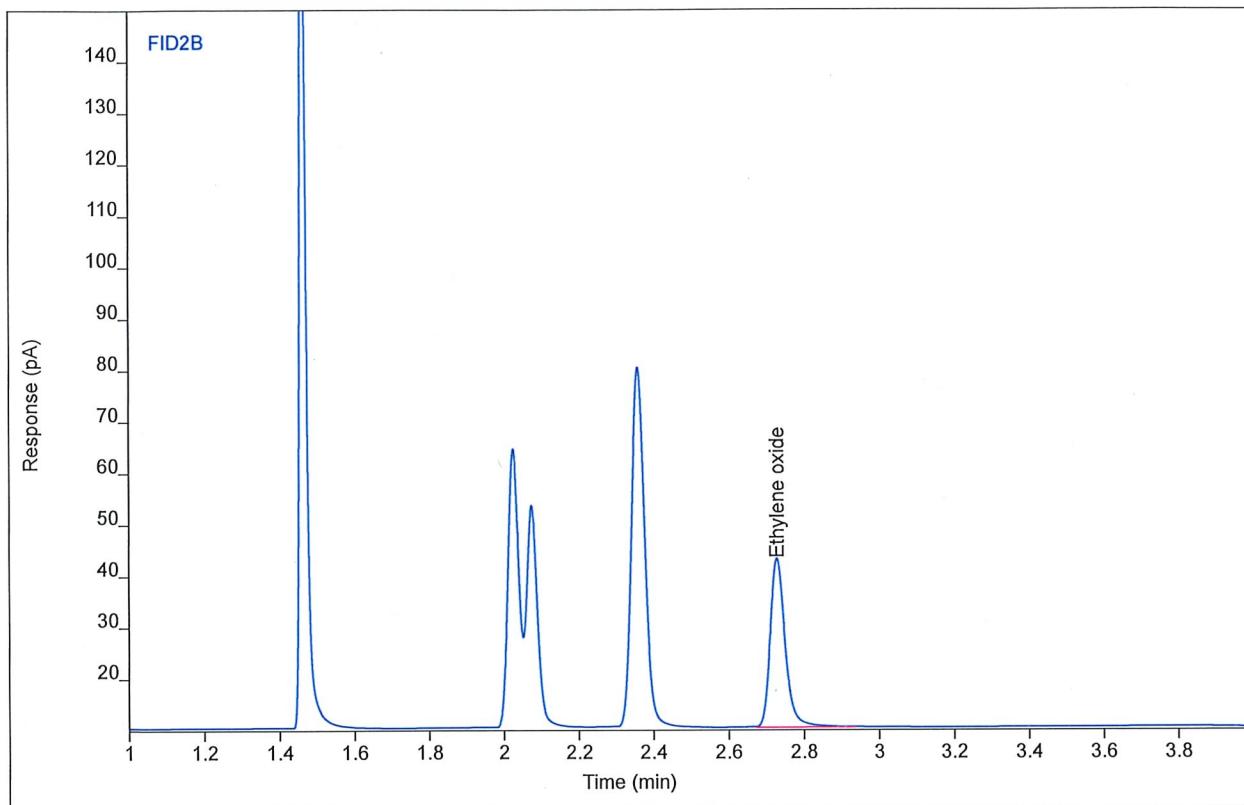
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 90.8804 | 32.5749 | 232.801 | 1  | 232.801 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0304.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 12:47 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



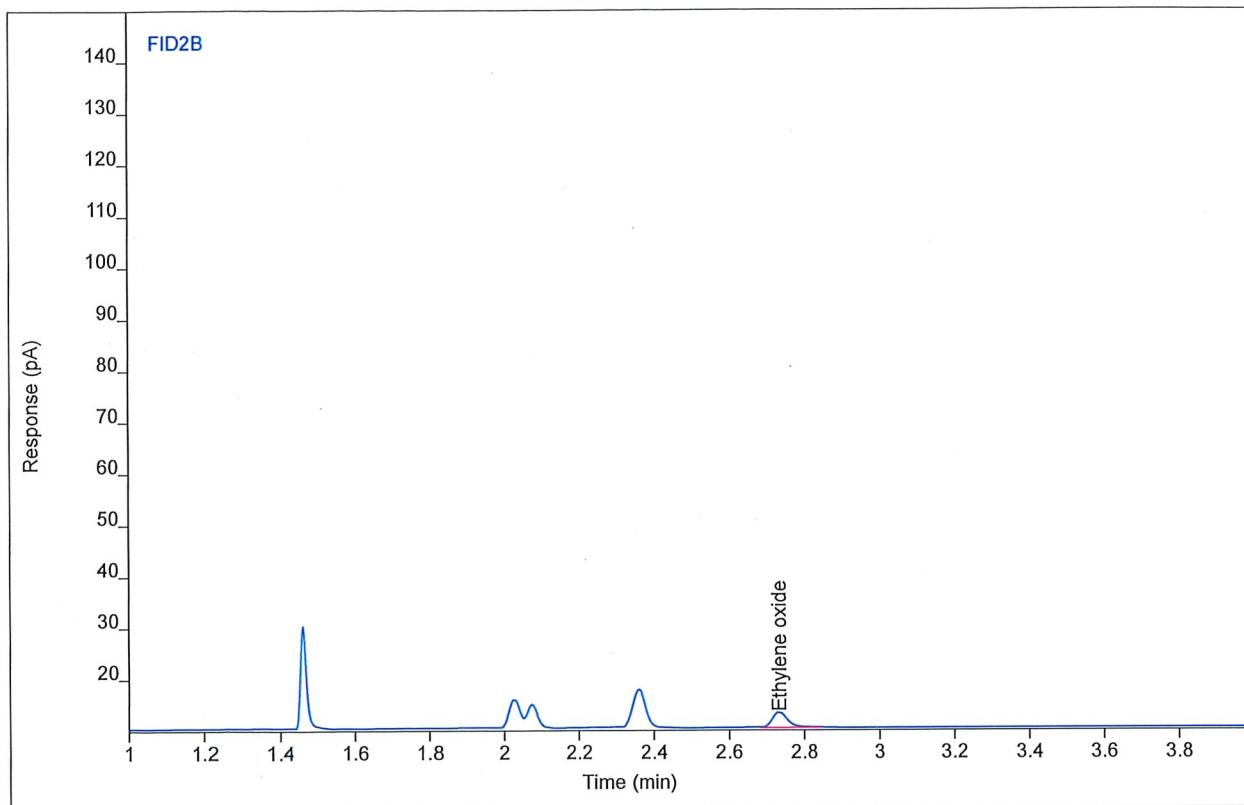
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 91.1803 | 32.8261 | 233.566 | 1  | 233.566 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0402.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 1:36 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



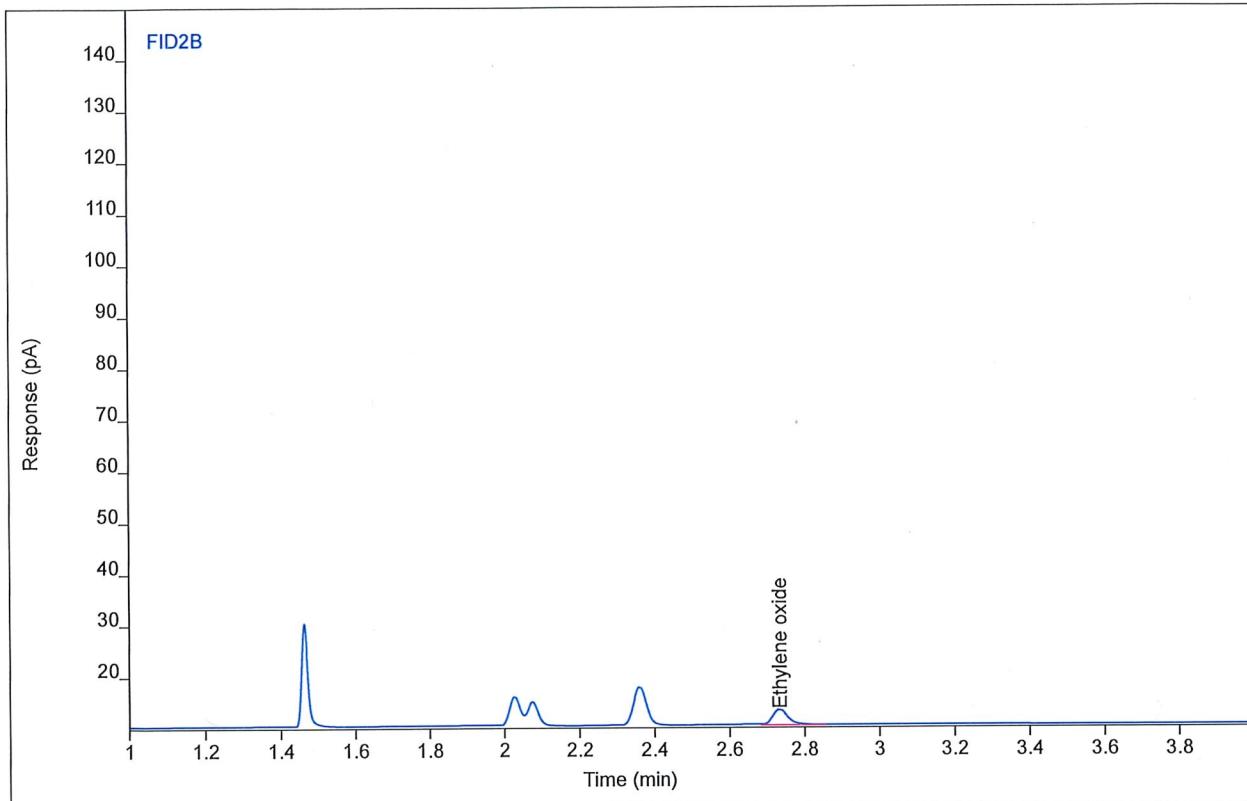
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.71569 | 3.07744 | 23.2449 | 1  | 23.2449 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0403.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 2:01 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



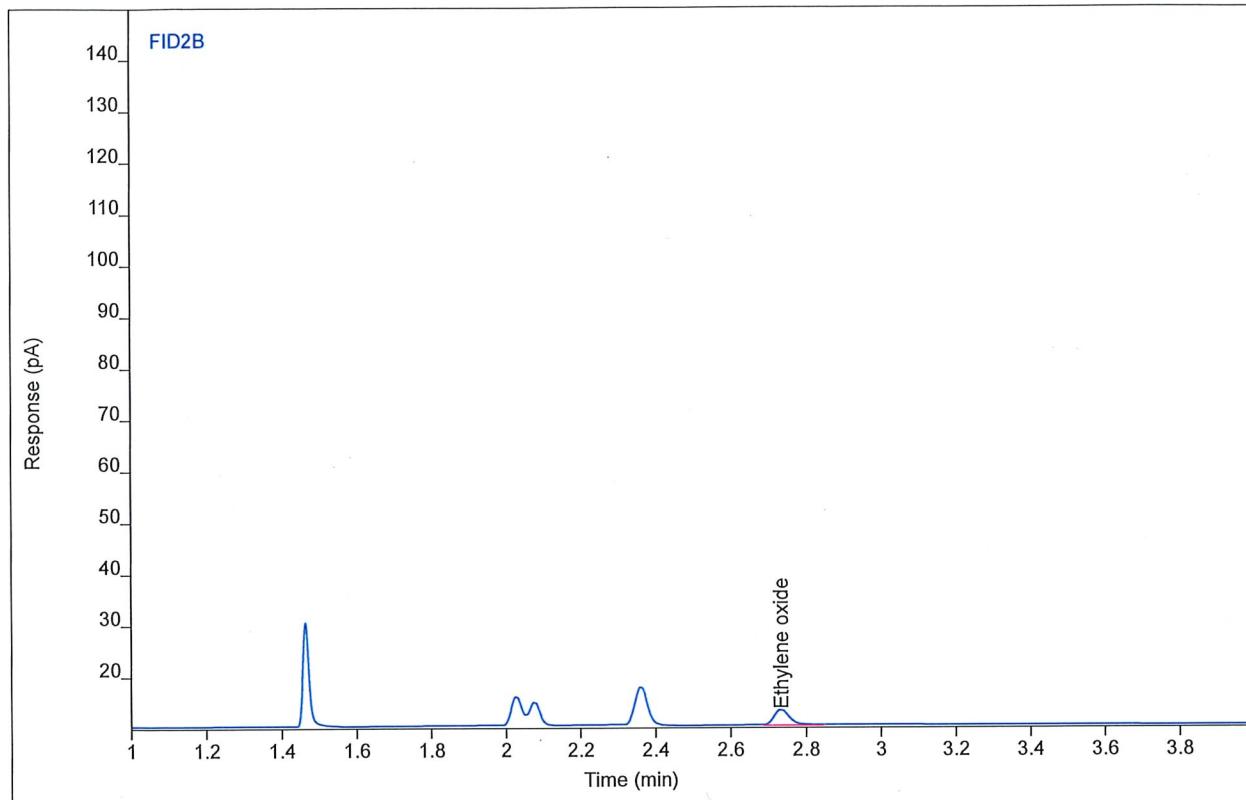
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.77991 | 3.09600 | 23.4087 | 1  | 23.4087 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0404.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 2:25 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



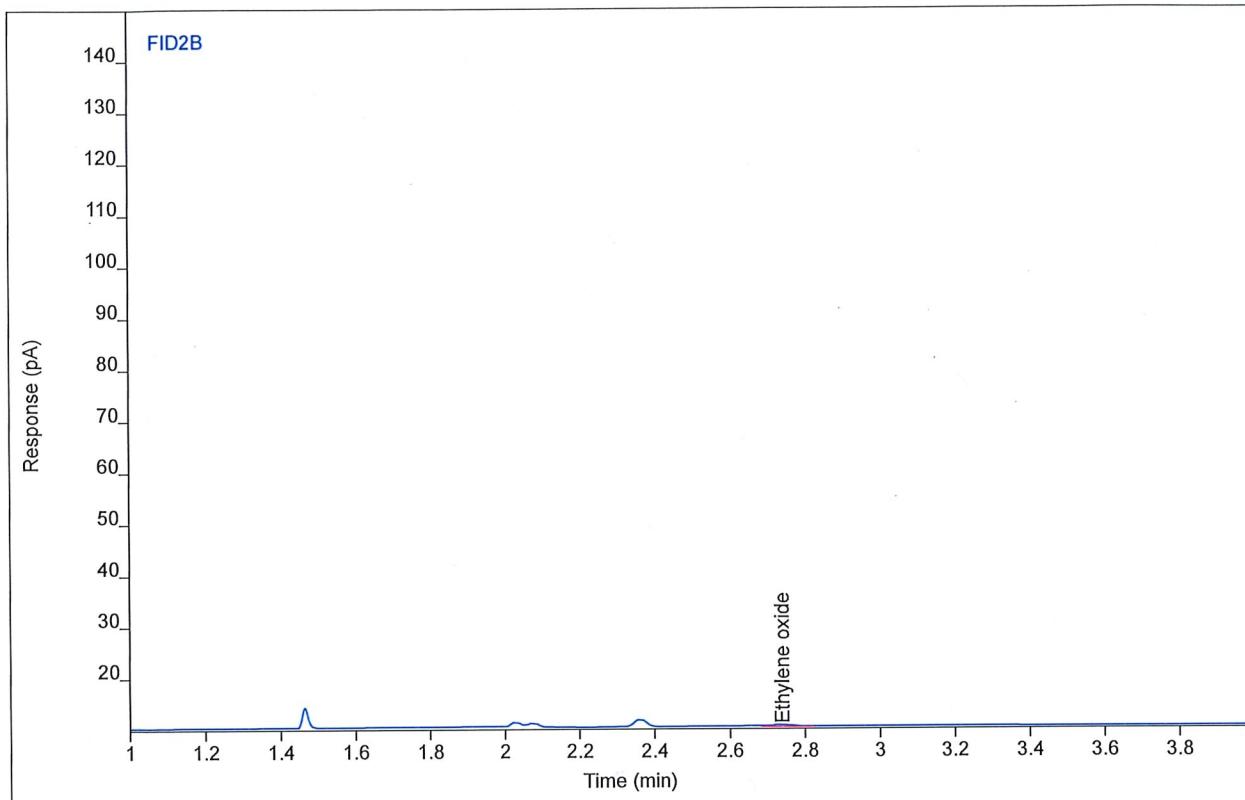
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 8.75797 | 3.10324 | 23.3527 | 1  | 23.3527 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0502.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 3:15 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM



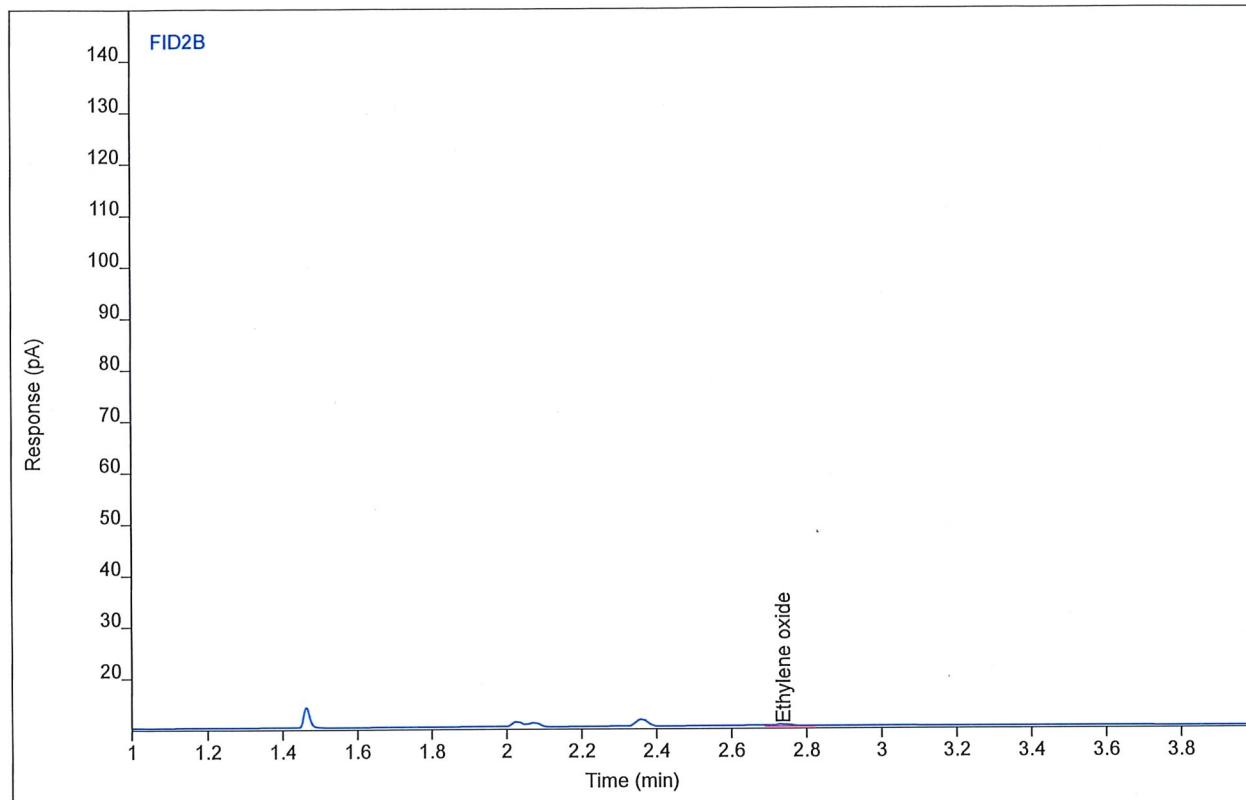
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.55800 | 0.53037 | 4.95737 | 1  | 4.95737 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name BETTYP1038 ver.3  
Inj Data File 025B0503.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/12/2019 3:40 PM  
File Modified 2/13/2019 8:52 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1038\_EO\_COMBINED.M  
Method Modified 2/13/2019 6:17 AM  
Printed 2/13/2019 9:22 AM

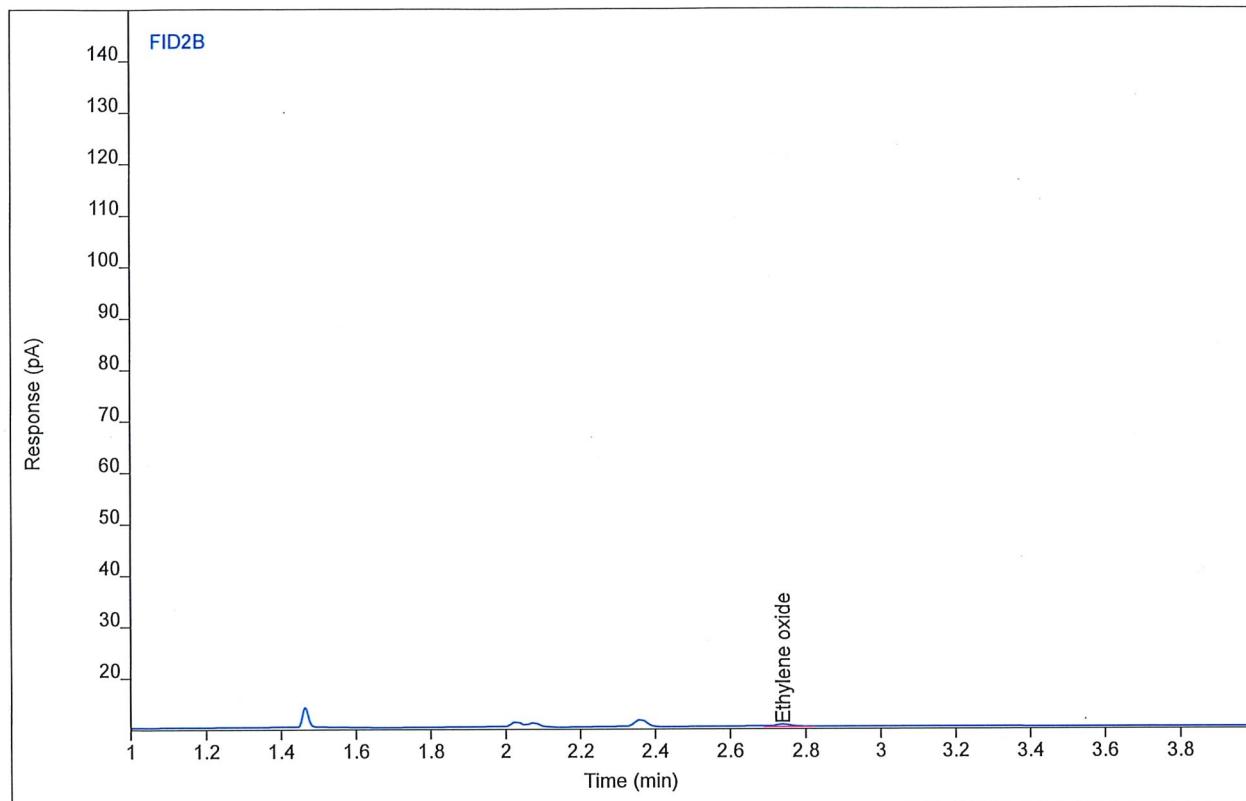


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.52873 | 0.52595 | 4.86423 | 1  | 4.86423 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                          |
|----------------|--------------------------------------|--------------------|--------------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration              |
| Sequence Name  | BETTYP1038 ver.3                     | Vial Number        | Vial 25                  |
| Inj Data File  | 025B0504.D                           | Injection Volume   | 250                      |
| File Location  | GC/2019/Betty/Quarter 1              | Injection          | 4 of 4                   |
| Injection Date | 2/12/2019 4:04 PM                    | Acquisition Method | GC142P133_CAL.M          |
| File Modified  | 2/13/2019 8:52 AM                    | Analysis Method    | BETTYP1038_EO_COMBINED.M |
| Instrument     | Betty                                | Method Modified    | 2/13/2019 6:17 AM        |
| Operator       | Justin Guenzler                      | Printed            | 2/13/2019 9:22 AM        |



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.50002 | 0.52024 | 4.77287 | 1  | 4.77287 | ppm  |

THE LINDE GROUP



**SHIPPED TO:** Enthalpy Analytical Inc.  
3211 Bramer Drive  
Raleigh , NC 27604

**PAGE:** 1 of 1

### CERTIFICATE OF ANALYSIS

|                            |                |                                         |
|----------------------------|----------------|-----------------------------------------|
| <b>Sales#:</b>             | 116533174      | <b>Cylinder Size:</b> 152 (8" X 47.5")  |
| <b>Production#:</b>        | 1460819        | <b>Cylinder # :</b> CC-314745           |
| <b>Certification Date:</b> | Jul-13-2018    | <b>Cylinder Pressure:</b> 2000 psig     |
| <b>P.O.# :</b>             | PO1022200      | <b>Cylinder Valve:</b> CGA 350 / Steel  |
| <b>Blend Type:</b>         | CERTIFIED      | <b>Cylinder Volume:</b> 29.5 Liter      |
| <b>Material#:</b>          | 24102763       | <b>Cylinder Material:</b> Aluminum      |
| <b>Traceability:</b>       | NIST by weight | <b>Gas Volume:</b> 4000 Liters          |
| <b>Expiration Date:</b>    | Jul-13-2019    | <b>Blend Tolerance:</b> 5% Relative     |
| <b>Do NOT use under:</b>   | 150 psig       | <b>Analytical Accuracy:</b> 2% Relative |

| <b>COMPONENT</b>   | <b>CAS NUMBER</b> | <b>REQUESTED CONC</b> | <b>CERTIFIED CONC</b> |
|--------------------|-------------------|-----------------------|-----------------------|
| Acetylene          | 74-86-2           | 250 ppm               | 255 ppm               |
| Chloromethane      | 74-87-3           | 250 ppm               | 255 ppm               |
| Vinyl Chloride     | 75-01-4           | 250 ppm               | 255 ppm               |
| Dimethyl Ether     | 115-10-6          | 250 ppm               | 259 ppm               |
| Ethylene Oxide     | 75-21-8           | 250 ppm               | 256 ppm               |
| Methylene Chloride | 75-09-2           | 250 ppm               | 256 ppm               |
| Cyclohexane        | 110-82-7          | 250 ppm               | 257 ppm               |
| Isooctane          | 540-84-1          | 250 ppm               | 258 ppm               |
| <br>               |                   |                       |                       |
| Nitrogen           | 7727-37-9         | Balance               | Balance               |

**ANALYST:** Lou Lorenzetti

Lou Lorenzetti

**DATE:** Jul-13-2018

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED HYDROCARBON**

Customer: \*MORRISVILLE , NC\* - MONTROSE ENVIRONMENTAL  
GROUP

Part X02NI99C15ACKW8

Reference Number: 126-400875670-1

Number:  
Cylinder CC122424

Cylinder Volume: 114.8 CF

Number:  
Laboratory: 124 - LaPorte Mix (SAP) - TX  
Analysis Mar 09, 2017

Cylinder Pressure: 1602 PSIG  
Valve Outlet: 350

Date:  
Lot Number: 126-400875670-1

Expiration Date: Mar 09, 2019

Traceability Statement: Hydrocarbon Process standards are NIST traceable either directly by weight or by comparison to Airgas laboratory standards that are directly NIST traceable by weight.

**CERTIFIED CONCENTRATIONS**

| Component      | Requested<br>Concentration | Reported<br>Volume % | Accuracy |
|----------------|----------------------------|----------------------|----------|
| ETHYLENE OXIDE | 250.0 PPM                  | 242.6 PPM            | +/- 2%   |
| NITROGEN       | 99.98 %                    | 99.97574 %           | +/- 2%   |

Permanent Notes: MONTROSE ENVIRONMENTAL/ENTHALPY ANALYTICAL

Notes:

RECERTIFICATION

PO # 1007021

MONTROSE ENVIRONMENTAL / ENTHALPY ANALYTICAL



B.J. Schmidhauser  
Approved for Release

Page 1 of 126-400875670-1

=====  
6890 GC METHOD  
=====

OVEN

Initial temp: 40 C (On) Maximum temp: 250 C  
Initial time: 6.00 min Equilibration time: 0.50 min  
Ramps:  
# Rate Final temp Final time CRYO (N2)  
1 30.00 220 2.00 Cryo: Off  
2 0 (Off) Cryo fault: On  
Post temp: 40 C Cryo timeout: 40.00 min (On)  
Post time: 0.00 min Quick cryo cool: Off  
Run time: 14.00 min Ambient temp: 30 C

FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
Initial temp: 200 C (On)  
Pressure: 60.0 psi (On)  
Purge flow: 0.0 mL/min  
Purge time: 0.00 min  
Total flow: 12.3 mL/min  
Gas saver: Off  
Gas type: Helium

BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
Initial temp: 200 C (On)  
Pressure: 11.6 psi (On)  
Split ratio: 5:1  
Split flow: 12.3 mL/min  
Total flow: 17.6 mL/min  
Gas saver: Off  
Gas type: Helium

COLUMN 1

Packed Column  
Model Number: 19808  
Description: Rt-ShinCarbon 2m x 1mm I  
Max temperature: 250 C  
Mode: constant pressure  
Pressure: 60.0 psi  
Inlet: Front Inlet  
Outlet: Front Detector  
Outlet pressure: ambient

COLUMN 2

Capillary Column  
Model Number: 10198  
Description: Rtx-1 30m x 0.32mm x 4um  
Max temperature: 250 C  
Nominal length: 30.0 m  
Nominal diameter: 320.00 um  
Nominal film thickness: 4.00 um  
Mode: constant flow  
Initial flow: 2.5 mL/min  
Nominal init pressure: 11.6 psi  
Average velocity: 39 cm/sec  
Inlet: Back Inlet  
Outlet: (other)  
Outlet pressure: ambient

FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
Reference flow: 20.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 10.0 mL/min (On)  
Makeup Gas Type: Helium  
Filament: On  
Negative polarity: On

BACK DETECTOR (FID)

Temperature: 250 C (On)  
Hydrogen flow: 60.0 mL/min (On)  
Air flow: 450.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 40.0 mL/min (On)  
Makeup Gas Type: Nitrogen  
Flame: On  
Electrometer: On  
Lit offset: 2.0

SIGNAL 1

Data rate: 20 Hz  
Type: front detector  
Save Data: On

SIGNAL 2

Data rate: 20 Hz  
Type: back detector  
Save Data: On

THERMAL AUX 1

Use: Valve Box Heater  
Initial temp: 130 C (On)

VALVES

Valve 1 Gas Sampling  
Loop Volume: 0.250 mL

POST RUN

Post Time: 0.00 min

dified on: 5/5/2014 at 7:51:02 AM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint         |
|------------|------------------------------|
| 3.00       | Front Detector Polarity: Off |

=====  
6890 GC METHOD  
=====

OVEN

Initial temp: 40 C (On) Maximum temp: 250 C  
Initial time: 3.00 min Equilibration time: 0.50 min  
Ramps:  
# Rate Final temp Final time CRYO (N2)  
1 0 (Off) Cryo: Off  
Post temp: 40 C Cryo fault: On  
Post time: 0.00 min Cryo timeout: 40.00 min (On)  
Run time: 3.00 min Quick cryo cool: Off  
Ambient temp: 30 C

FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
Initial temp: 200 C (On)  
Pressure: 60.0 psi (On)  
Purge flow: 0.0 mL/min  
Purge time: 0.00 min  
Total flow: 12.3 mL/min  
Gas saver: Off  
Gas type: Helium

BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
Initial temp: 200 C (On)  
Pressure: 11.7 psi (On)  
Split ratio: 5:1  
Split flow: 12.3 mL/min  
Total flow: 17.6 mL/min  
Gas saver: Off  
Gas type: Helium

COLUMN 1

Packed Column  
Model Number: 19808  
Description: Rt-ShinCarbon 2m x 1mm I  
Max temperature: 250 C  
Mode: constant pressure  
Pressure: 60.0 psi  
Inlet: Front Inlet  
Outlet: Front Detector  
Outlet pressure: ambient

COLUMN 2

Capillary Column  
Model Number: 10198  
Description: Rtx-1 30m x 0.32mm x 4um  
Max temperature: 250 C  
Nominal length: 30.0 m  
Nominal diameter: 320.00 um  
Nominal film thickness: 4.00 um  
Mode: constant flow  
Initial flow: 2.5 mL/min  
Nominal init pressure: 11.7 psi  
Average velocity: 39 cm/sec  
Inlet: Back Inlet  
Outlet: (other)  
Outlet pressure: ambient

FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
Reference flow: 20.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 10.0 mL/min (On)  
Makeup Gas Type: Helium  
Filament: On  
Negative polarity: On

BACK DETECTOR (FID)

Temperature: 250 C (On)  
Hydrogen flow: 60.0 mL/min (On)  
Air flow: 450.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 40.0 mL/min (On)  
Makeup Gas Type: Nitrogen  
Flame: On  
Electrometer: On  
Lit offset: 2.0

SIGNAL 1

Data rate: 20 Hz  
Type: front detector  
Save Data: On

SIGNAL 2

Data rate: 20 Hz  
Type: back detector  
Save Data: On

THERMAL AUX 1

Use: Valve Box Heater  
Initial temp: 130 C (On)

VALVES

Valve 1 Gas Sampling  
Loop Volume: 0.250 mL

POST RUN

Post Time: 0.00 min

dified on: 2/17/2014 at 5:52:35 PM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint |
|------------|----------------------|
|------------|----------------------|

=====

Calibration Table

=====

Calib. Data Modified : 2/11/2019 9:49:40 AM

Rel. Reference Window : 1.000 %  
Abs. Reference Window : 0.000 min  
Rel. Non-ref. Window : 1.000 %  
Abs. Non-ref. Window : 0.000 min  
Uncalibrated Peaks : using compound Ethylene oxide  
Partial Calibration : Yes, identified peaks are recalibrated  
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear  
Origin : Connected  
Weight : Quadratic (Amnt)

Recalibration Settings:  
Average Response : Average all calibrations  
Average Retention Time: Floating Average New 75%

Calibration Report Options :  
Printout of recalibrations within a sequence:  
    Calibration Table after Recalibration  
    Normal Report after Recalibration  
If the sequence is done with bracketing:  
    Results of first cycle (ending previous bracket)

Signal 1: FID2 B,

| RetTime<br>[min] | Lvl<br>Sig | Amount<br>[ppm] | Area      | Amt/Area | Ref Grp | Name           |
|------------------|------------|-----------------|-----------|----------|---------|----------------|
| 2.738            | 1          | 5.12000         | 1.67990   | 3.04779  |         | Ethylene oxide |
|                  | 2          | 25.60000        | 10.61953  | 2.41065  |         |                |
|                  | 3          | 78.77000        | 34.15258  | 2.30641  |         |                |
|                  | 4          | 256.00000       | 102.23157 | 2.50412  |         |                |

More compound-specific settings:

Compound: Ethylene oxide  
Time Window : From 2.691 min To 2.756 min

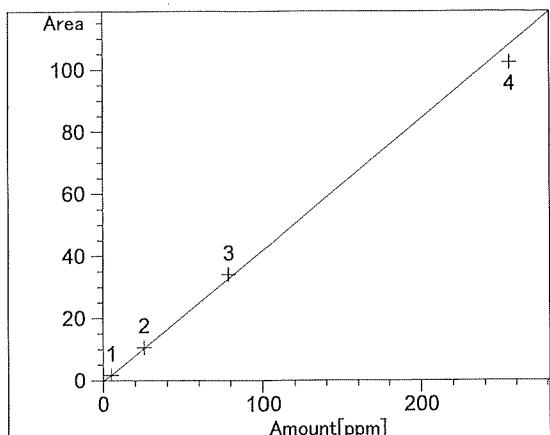
=====

Peak Sum Table

=====

\*\*\*No Entries in table\*\*\*

### Calibration Curves



Ethylen oxide at exp. RT: 2.738

FID2 B,

Correlation: 0.99901

Residual Std. Dev.: 4.21354

Formula:  $y = mx + b$

$m: 4.23961e-1$

$b: -4.78115e-1$

x: Amount

y: Area

Calibration Level Weights:

Level 1 : 1

Level 2 : 0.04

Level 3 : 0.004225

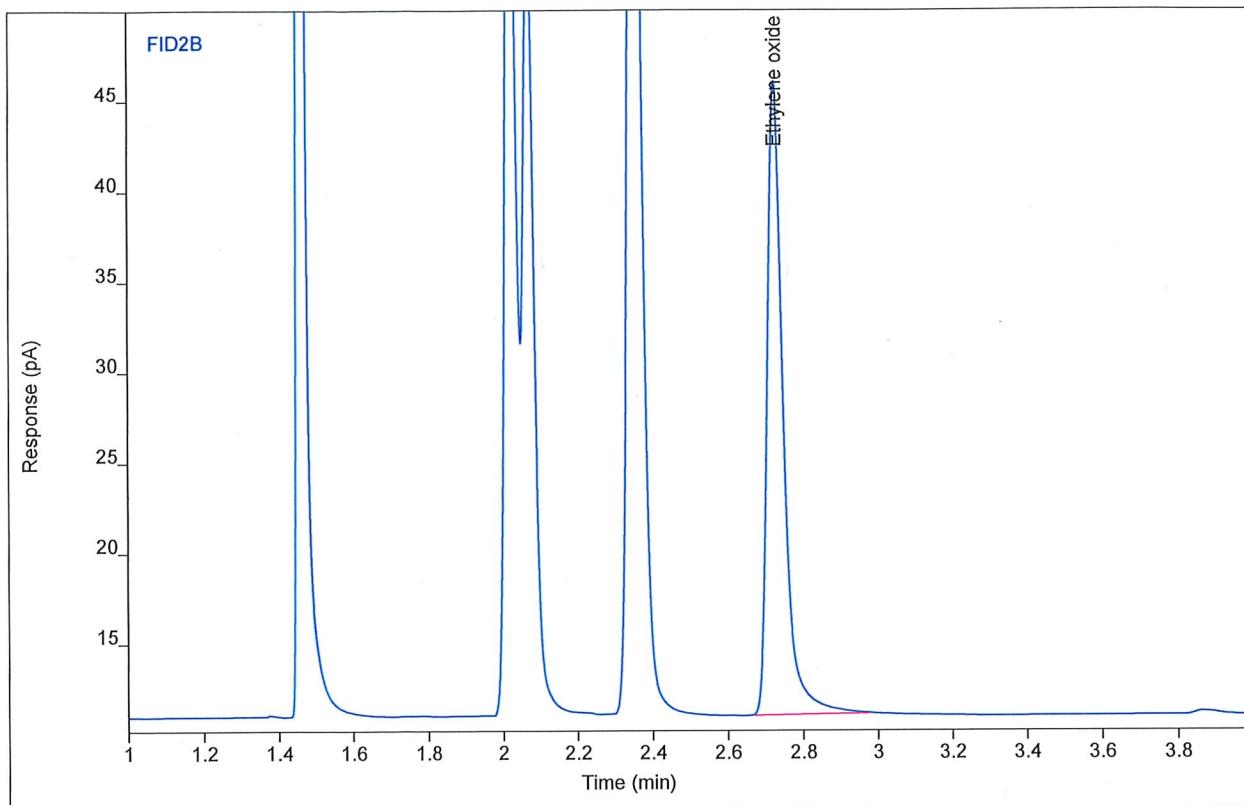
Level 4 : 0.0004

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_002\_\_018\_025B1402.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 1:55 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



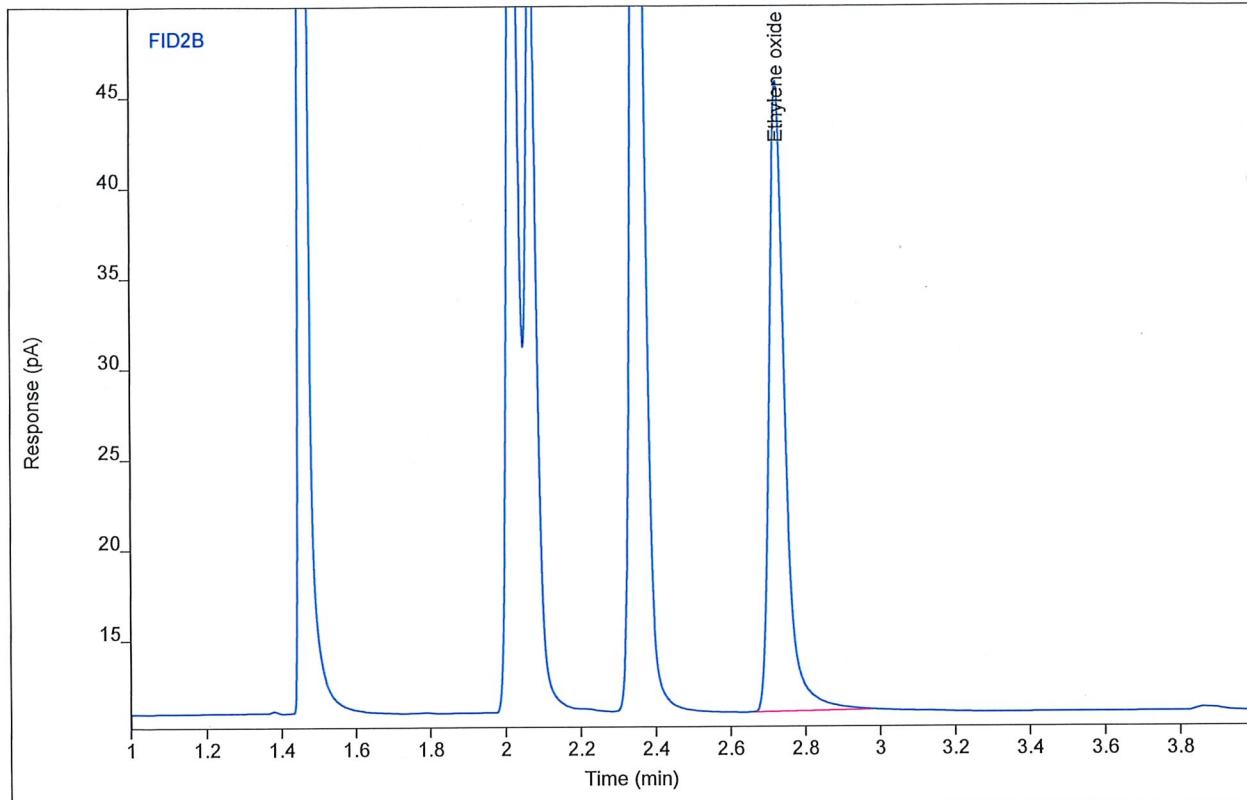
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 103.026 | 35.0330 | 244.137 | 1  | 244.137 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_003\_019\_025B1403.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 2:19 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



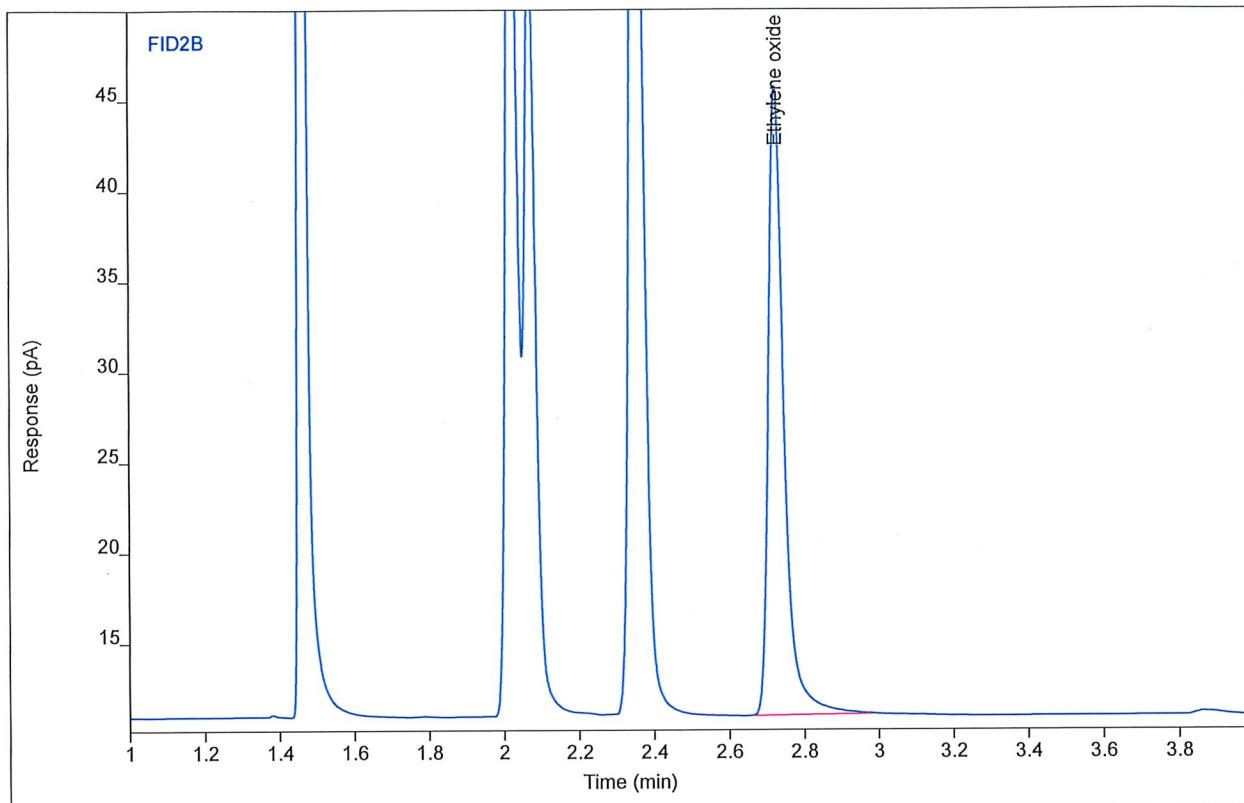
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 102.107 | 34.8520 | 241.967 | 1  | 241.967 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC4 ENV(1=0,6=400)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_004\_020\_025B1404.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 2:44 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



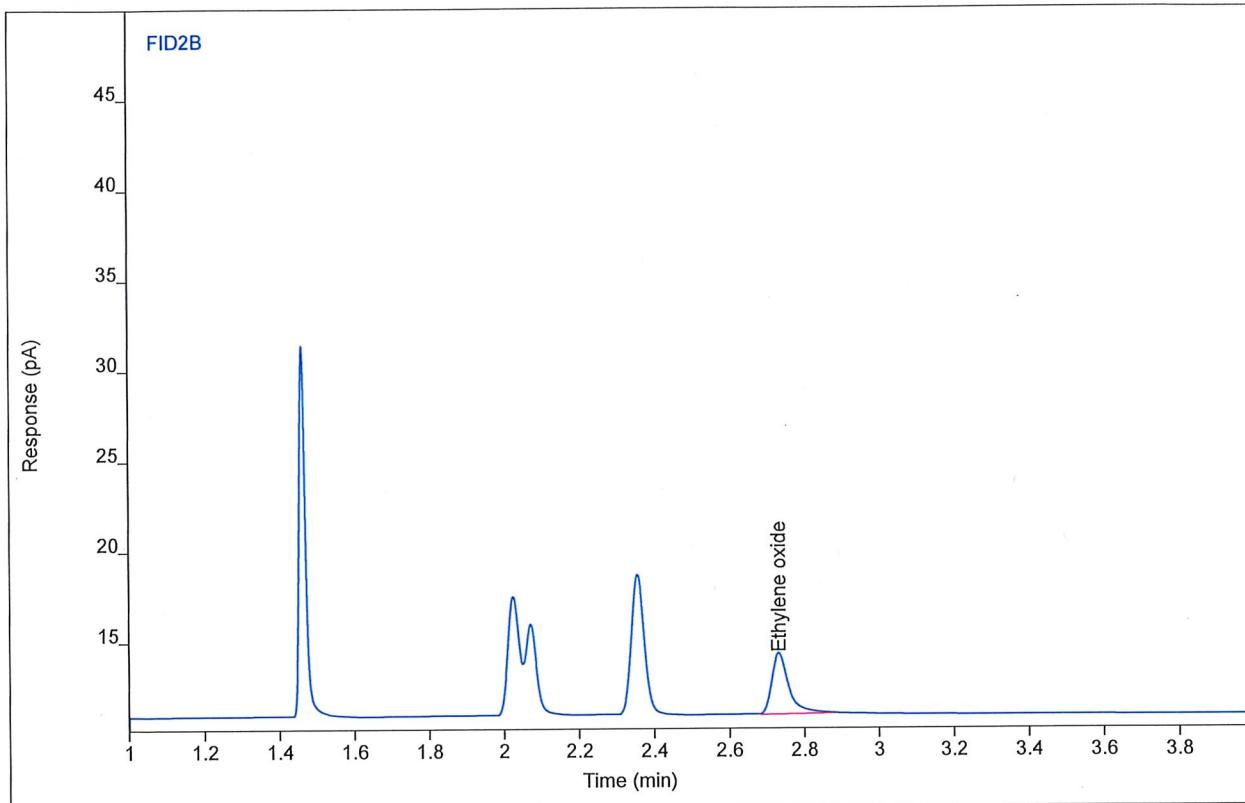
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 101.562 | 34.7635 | 240.683 | 1  | 240.683 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_006\_\_022\_025B1502.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 3:33 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 2 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



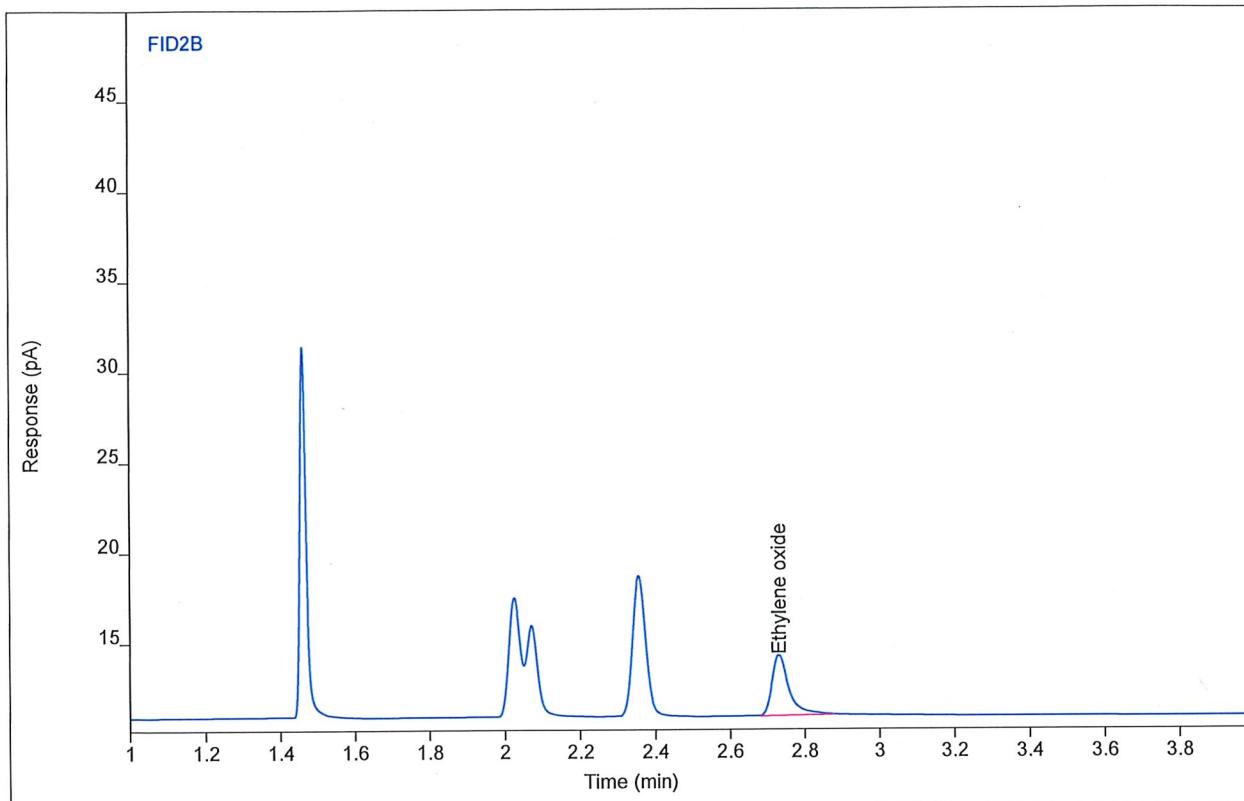
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.6351 | 3.40064 | 26.2128 | 1  | 26.2128 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_007\_023\_025B1503.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 3:58 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



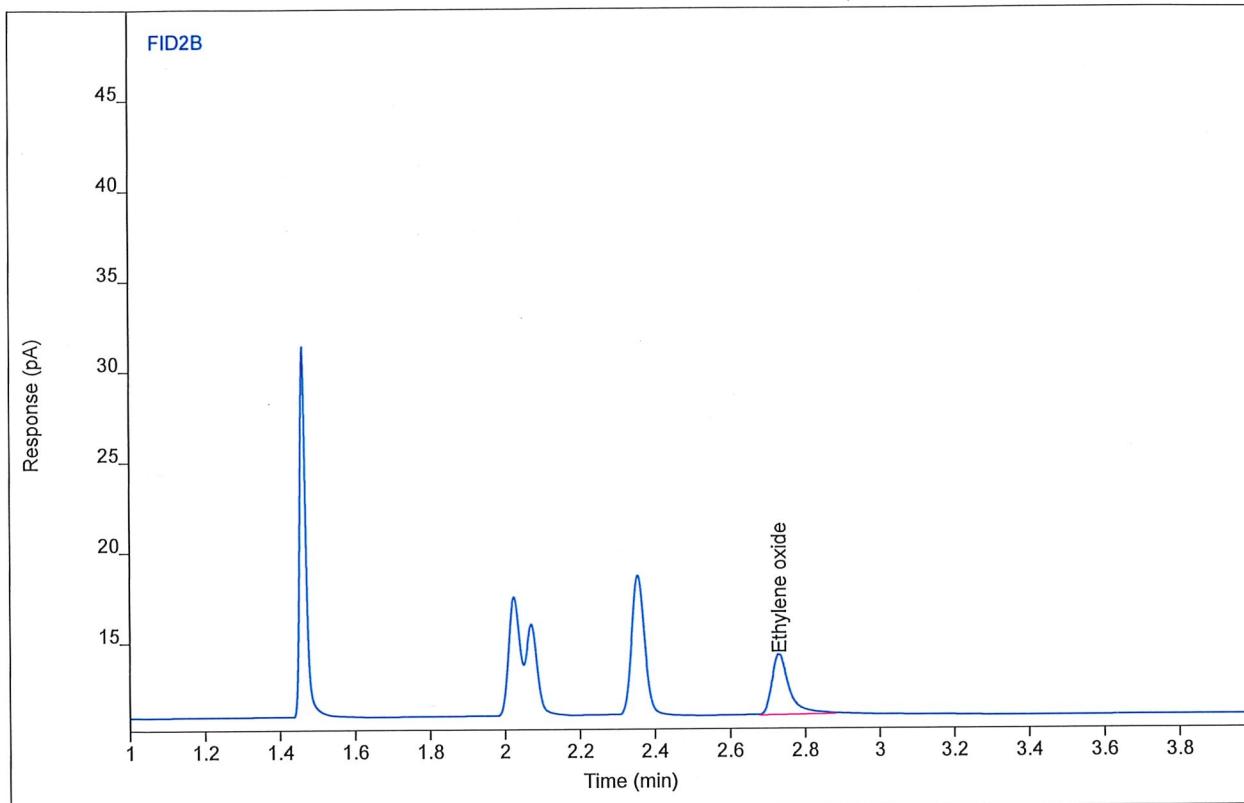
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.5770 | 3.37193 | 26.0759 | 1  | 26.0759 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC2 ENV(1=636,6=100)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_008\_024\_025B1504.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 4:22 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



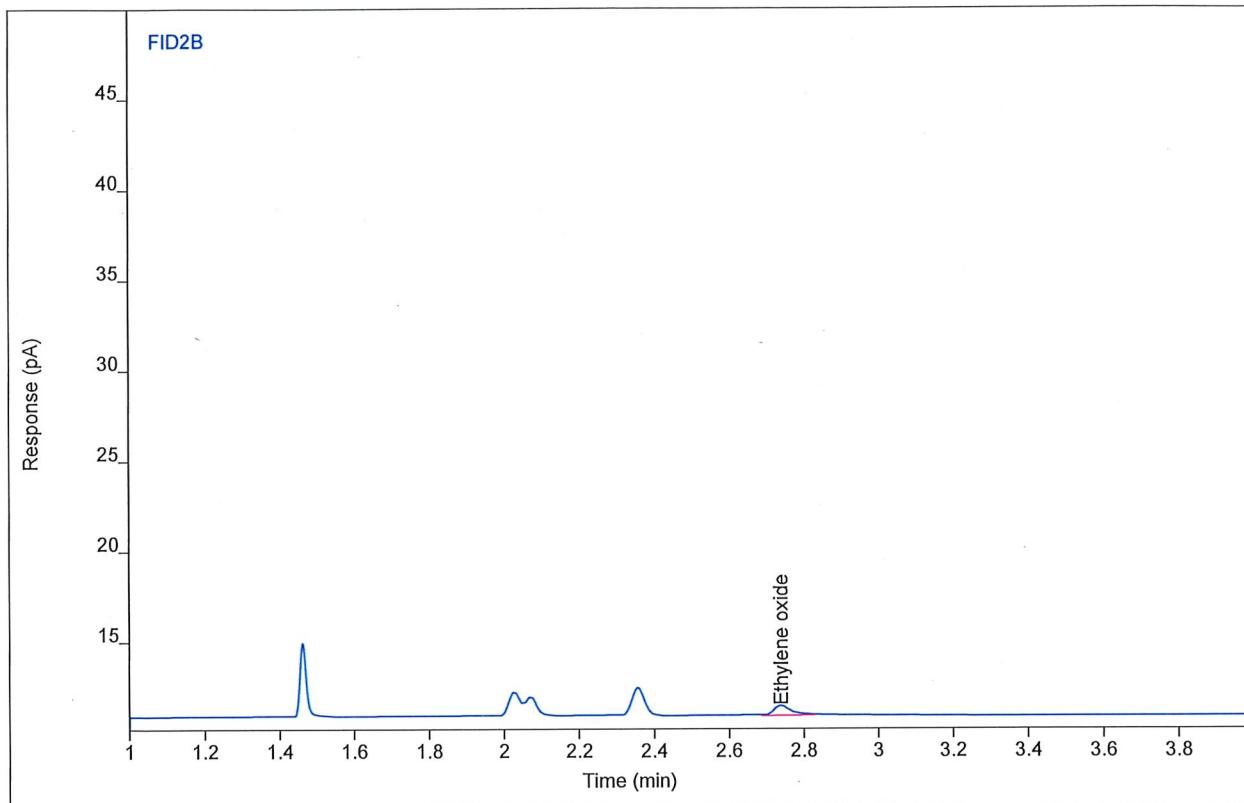
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 10.6465 | 3.37035 | 26.2396 | 1  | 26.2396 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_010\_\_026\_025B1602.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 5:11 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial Number Calibration  
Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM



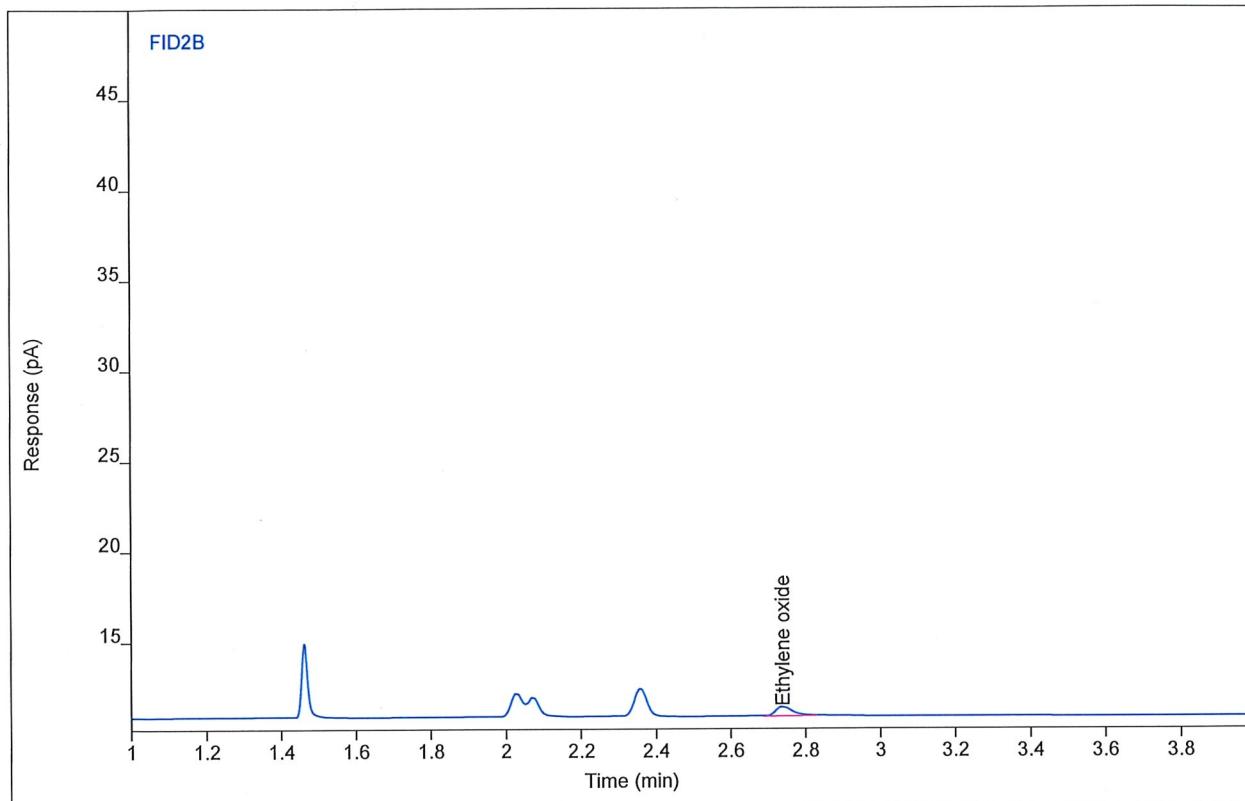
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.72307 | 0.54717 | 5.19195 | 1  | 5.19195 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC1 ENV(1=3462.65,6=100)  
Sequence Name Bettyp1033 R2 ver.3  
Inj Data File \_011\_027\_025B1603.D  
File Location GC/2019/Rosie/Quarter 1  
Injection Date 2/10/2019 5:36 PM  
File Modified 2/14/2019 1:21 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:26 PM

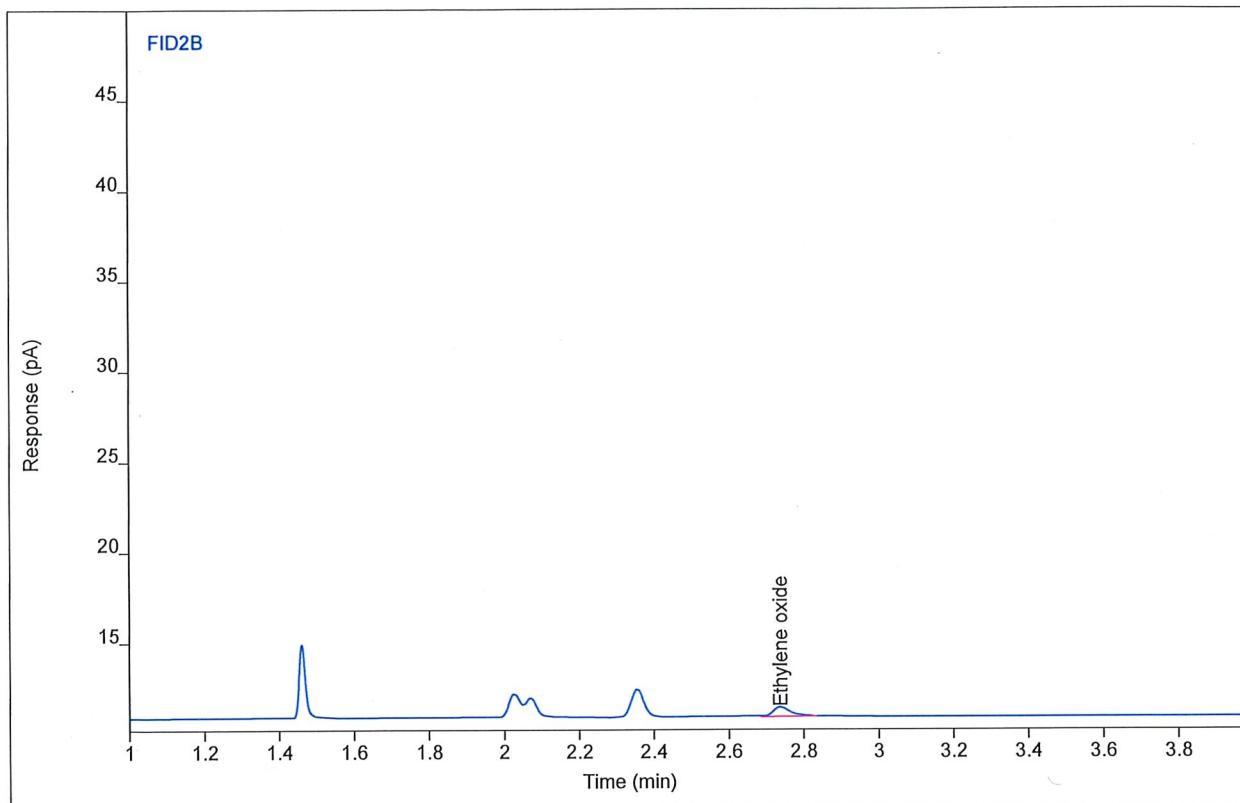


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.67475 | 0.52475 | 5.06610 | 1  | 5.06610 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                      |                    |                   |
|----------------|--------------------------------------|--------------------|-------------------|
| Sample Name    | BettyP1029 #SC1 ENV(1=3462.65,6=100) | Sample Type        | Calibration       |
| Sequence Name  | Bettyp1033 R2 ver.3                  | Vial Number        | Vial 25           |
| Inj Data File  | _012__028_025B1604.D                 | Injection Volume   | 250               |
| File Location  | GC/2019/Rosie/Quarter 1              | Injection          | 4 of 4            |
| Injection Date | 2/10/2019 6:01 PM                    | Acquisition Method | GC142P133_CAL.M   |
| File Modified  | 2/14/2019 1:21 PM                    | Analysis Method    | BETTYP1033_EO.M   |
| Instrument     | Betty                                | Method Modified    | 1/2/2014 5:30 PM  |
| Operator       | Nicholas Traversa                    | Printed            | 2/14/2019 1:26 PM |



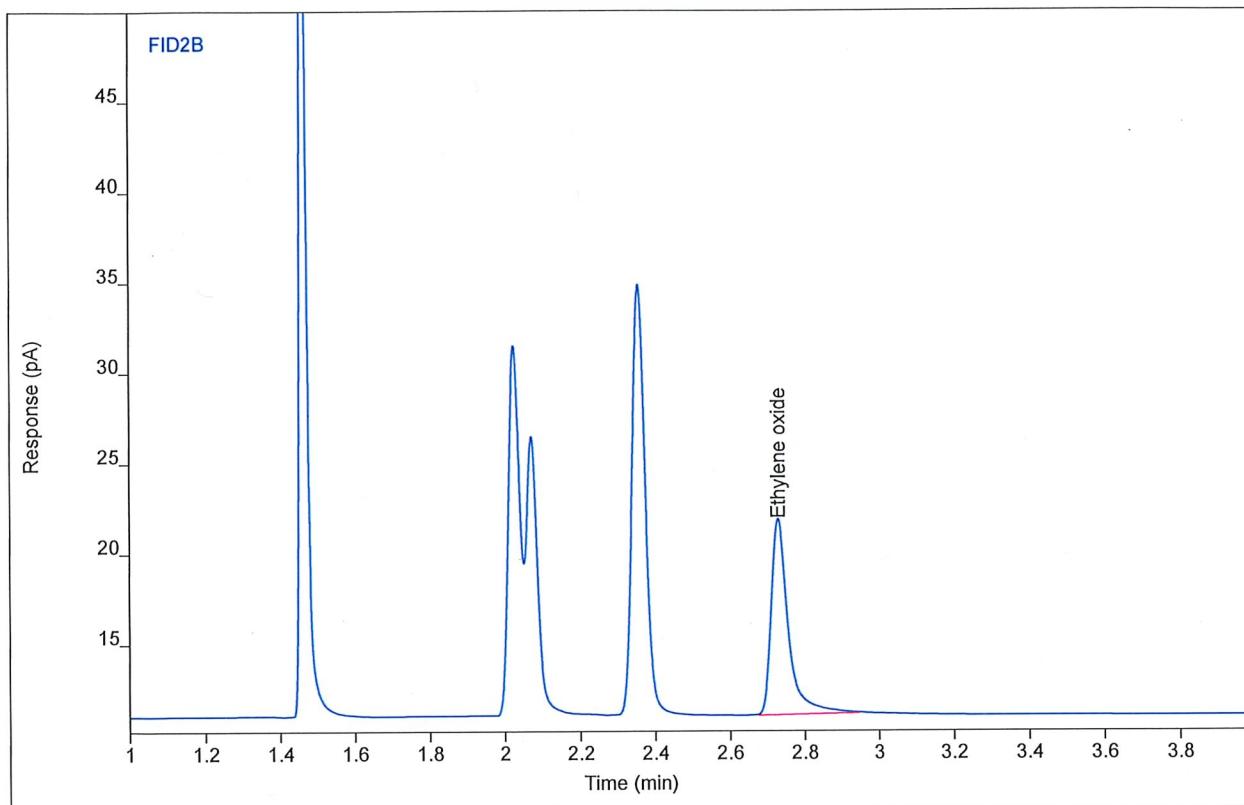
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.64190 | 0.52322 | 4.96674 | 1  | 4.96674 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R3 ver.3  
Inj Data File \_001\_014\_025B1302.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/10/2019 12:17 PM  
File Modified 2/14/2019 1:22 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 2 of 3  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:27 PM



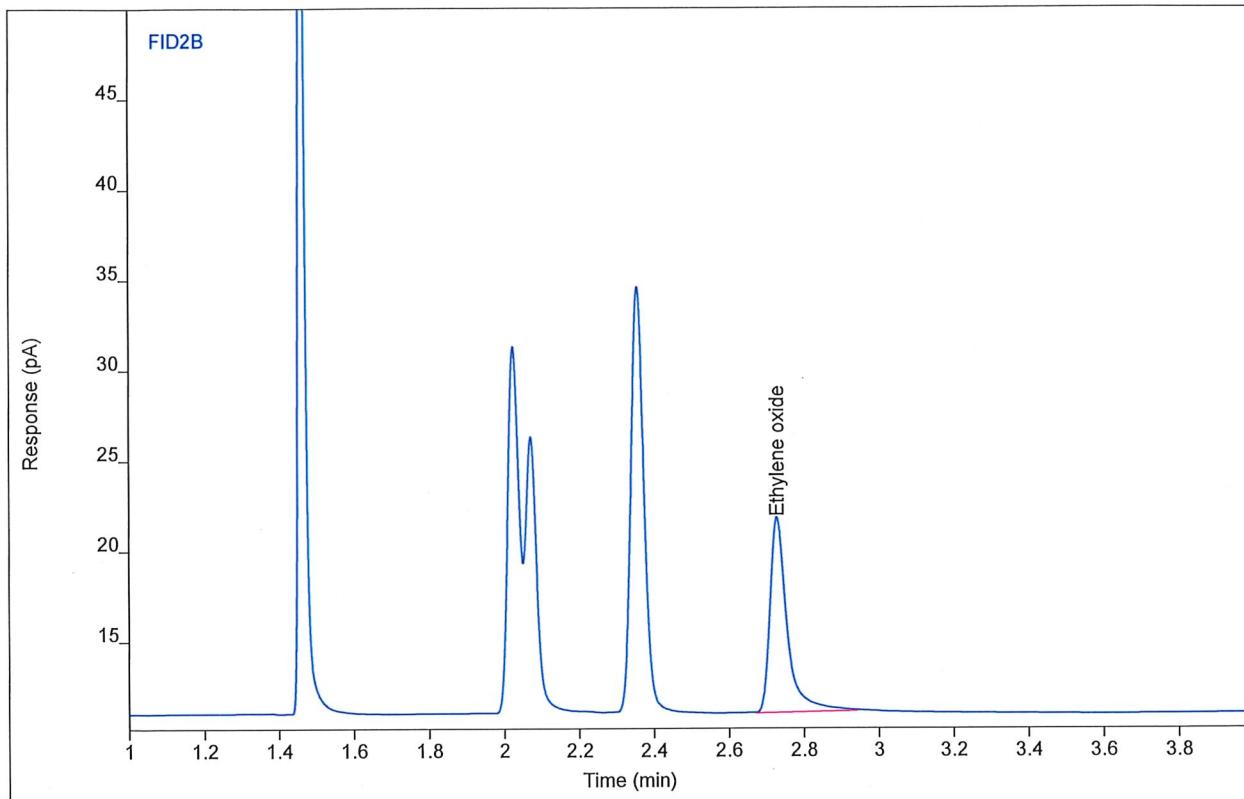
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 34.2866 | 10.8255 | 81.9999 | 1  | 81.9999 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R3 ver.3  
Inj Data File \_002\_\_015\_025B1303.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/10/2019 12:41 PM  
File Modified 2/14/2019 1:22 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:27 PM



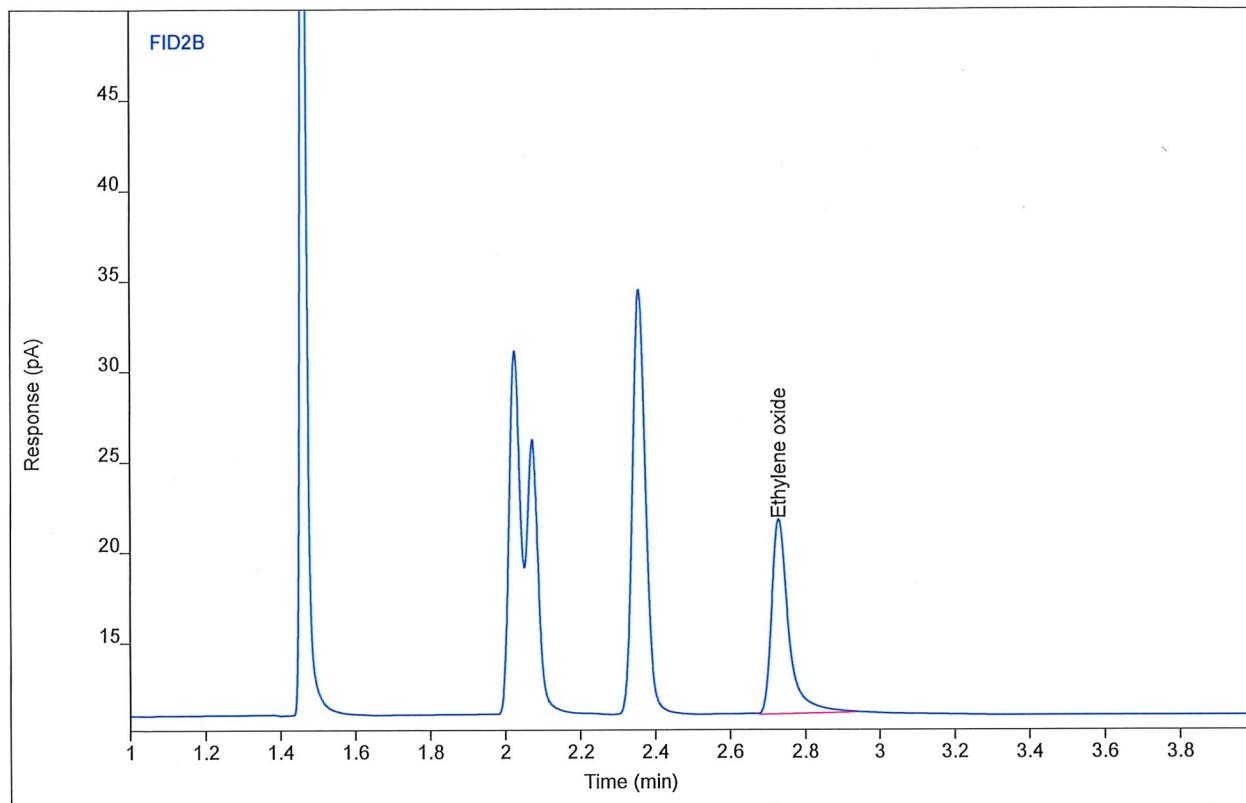
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 34.2721 | 10.8098 | 81.9656 | 1  | 81.9656 | ppm  |

# Chromatogram Report

Sample Name BettyP1029 #SC3 ENV(1=636,6=400)  
Sequence Name BettyP1033 R3 ver.3  
Inj Data File \_003\_016\_025B1304.D  
File Location GC/2019/Betty/Quarter 1  
Injection Date 2/10/2019 1:06 PM  
File Modified 2/14/2019 1:22 PM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 3  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP1033\_EO.M  
Method Modified 1/2/2014 5:30 PM  
Printed 2/14/2019 1:27 PM



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 33.8990 | 10.7752 | 81.0857 | 1  | 81.0857 | ppm  |

THE LINDE GROUP



**SHIPPED TO:** Enthalpy Analytical Inc.  
3211 Bramer Drive  
Raleigh , NC 27604

**PAGE:** 1 of 1

### CERTIFICATE OF ANALYSIS

|                            |                |                                         |
|----------------------------|----------------|-----------------------------------------|
| <b>Sales#:</b>             | 116533174      | <b>Cylinder Size:</b> 152 (8" X 47.5")  |
| <b>Production#:</b>        | 1460819        | <b>Cylinder # :</b> CC-314745           |
| <b>Certification Date:</b> | Jul-13-2018    | <b>Cylinder Pressure:</b> 2000 psig     |
| <b>P.O.# :</b>             | PO1022200      | <b>Cylinder Valve:</b> CGA 350 / Steel  |
| <b>Blend Type:</b>         | CERTIFIED      | <b>Cylinder Volume:</b> 29.5 Liter      |
| <b>Material#:</b>          | 24102763       | <b>Cylinder Material:</b> Aluminum      |
| <b>Traceability:</b>       | NIST by weight | <b>Gas Volume:</b> 4000 Liters          |
| <b>Expiration Date:</b>    | Jul-13-2019    | <b>Blend Tolerance:</b> 5% Relative     |
| <b>Do NOT use under:</b>   | 150 psig       | <b>Analytical Accuracy:</b> 2% Relative |

| <b>COMPONENT</b>   | <b>CAS NUMBER</b> | <b>REQUESTED CONC</b> | <b>CERTIFIED CONC</b> |
|--------------------|-------------------|-----------------------|-----------------------|
| Acetylene          | 74-86-2           | 250 ppm               | 255 ppm               |
| Chloromethane      | 74-87-3           | 250 ppm               | 255 ppm               |
| Vinyl Chloride     | 75-01-4           | 250 ppm               | 255 ppm               |
| Dimethyl Ether     | 115-10-6          | 250 ppm               | 259 ppm               |
| Ethylene Oxide     | 75-21-8           | 250 ppm               | 256 ppm               |
| Methylene Chloride | 75-09-2           | 250 ppm               | 256 ppm               |
| Cyclohexane        | 110-82-7          | 250 ppm               | 257 ppm               |
| Isooctane          | 540-84-1          | 250 ppm               | 258 ppm               |
| <br>               |                   |                       |                       |
| Nitrogen           | 7727-37-9         | Balance               | Balance               |

**ANALYST:** Lou Lorenzetti  
Lou Lorenzetti

**DATE:** Jul-13-2018

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED HYDROCARBON**

Customer: \*MORRISVILLE , NC\* - MONTROSE ENVIRONMENTAL

GROUP

Part X02NI99C15ACKW8

Reference Number: 126-400875670-1

Number:

Cylinder CC122424

Cylinder Volume: 114.8 CF

Number:

Laboratory: 124 - LaPorte Mix (SAP) - TX

Cylinder Pressure: 1602 PSIG

Analysis Mar 09, 2017

Valve Outlet: 350

Date:

Lot Number: 126-400875670-1

Expiration Date: Mar 09, 2019

Traceability Statement: Hydrocarbon Process standards are NIST traceable either directly by weight or by comparison to Airgas laboratory standards that are directly NIST traceable by weight.

**CERTIFIED CONCENTRATIONS**

| Component      | Requested Concentration | Reported Volume % | Accuracy |
|----------------|-------------------------|-------------------|----------|
| ETHYLENE OXIDE | 250.0 PPM               | 242.6 PPM         | +/- 2%   |
| NITROGEN       | 99.98 %                 | 99.97574 %        | +/- 2%   |

Permanent Notes: MONTROSE ENVIRONMENTAL/ENTHALPY ANALYTICAL

Notes:.

RECERTIFICATION

PO # 1007021

MONTROSE ENVIRONMENTAL / ENTHALPY ANALYTICAL

  
Approved for Release

Page 1 of 126-400875670-1

=====  
6890 GC METHOD  
=====

OVEN

Initial temp: 40 C (On) Maximum temp: 250 C  
Initial time: 6.00 min Equilibration time: 0.50 min  
Ramps:  
# Rate Final temp Final time CRYO (N2)  
1 30.00 220 2.00 Cryo: Off  
2 0 (Off) Cryo fault: On  
Post temp: 40 C Cryo timeout: 40.00 min (On)  
Post time: 0.00 min Quick cryo cool: Off  
Run time: 14.00 min Ambient temp: 30 C

FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
Initial temp: 200 C (On)  
Pressure: 60.0 psi (On)  
Purge flow: 0.0 mL/min  
Purge time: 0.00 min  
Total flow: 12.3 mL/min  
Gas saver: Off  
Gas type: Helium

BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
Initial temp: 200 C (On)  
Pressure: 11.6 psi (On)  
Split ratio: 5:1  
Split flow: 12.3 mL/min  
Total flow: 17.6 mL/min  
Gas saver: Off  
Gas type: Helium

COLUMN 1

Packed Column  
Model Number: 19808  
Description: Rt-ShinCarbon 2m x 1mm I  
Max temperature: 250 C  
Mode: constant pressure  
Pressure: 60.0 psi  
Inlet: Front Inlet  
Outlet: Front Detector  
Outlet pressure: ambient

COLUMN 2

Capillary Column  
Model Number: 10198  
Description: Rtx-1 30m x 0.32mm x 4um  
Max temperature: 250 C  
Nominal length: 30.0 m  
Nominal diameter: 320.00 um  
Nominal film thickness: 4.00 um  
Mode: constant flow  
Initial flow: 2.5 mL/min  
Nominal init pressure: 11.6 psi  
Average velocity: 39 cm/sec  
Inlet: Back Inlet  
Outlet: (other)  
Outlet pressure: ambient

FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
Reference flow: 20.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 10.0 mL/min (On)  
Makeup Gas Type: Helium  
Filament: On  
Negative polarity: On

BACK DETECTOR (FID)

Temperature: 250 C (On)  
Hydrogen flow: 60.0 mL/min (On)  
Air flow: 450.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 40.0 mL/min (On)  
Makeup Gas Type: Nitrogen  
Flame: On  
Electrometer: On  
Lit offset: 2.0

SIGNAL 1

Data rate: 20 Hz  
Type: front detector  
Save Data: On

SIGNAL 2

Data rate: 20 Hz  
Type: back detector  
Save Data: On

THERMAL AUX 1

Use: Valve Box Heater  
Initial temp: 130 C (On)

VALVES

Valve 1 Gas Sampling  
Loop Volume: 0.250 mL

POST RUN

Post Time: 0.00 min

dified on: 5/5/2014 at 7:51:02 AM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint         |
|------------|------------------------------|
| 3.00       | Front Detector Polarity: Off |

## 6890 GC METHOD

## OVEN

Initial temp: 40 C (On)                    Maximum temp: 250 C  
 Initial time: 3.00 min                    Equilibration time: 0.50 min  
 Ramps:  
 #      Rate      Final temp      Final time      CRYO (N2)  
 1      0 (Off)                                Cryo: Off  
 Post temp: 40 C                            Cryo fault: On  
 Post time: 0.00 min                        Cryo timeout: 40.00 min (On)  
 Run time: 3.00 min                        Quick cryo cool: Off  
                                                  Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.7 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.7 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 2/17/2014 at 5:52:35 PM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint |
|------------|----------------------|
|------------|----------------------|

=====

Calibration Table

=====

Calib. Data Modified : 11/20/2018 11:23:13 AM

Rel. Reference Window : 1.000 %  
Abs. Reference Window : 0.000 min  
Rel. Non-ref. Window : 1.000 %  
Abs. Non-ref. Window : 0.000 min  
Uncalibrated Peaks : using compound Ethylene oxide  
Partial Calibration : Yes, identified peaks are recalibrated  
Correct All Ret. Times: No, only for identified peaks

Curve Type : Linear  
Origin : Connected  
Weight : Quadratic (Amnt)

Recalibration Settings:  
Average Response : Average all calibrations  
Average Retention Time: Floating Average New 75%

Calibration Report Options :

Printout of recalibrations within a sequence:  
    Calibration Table after Recalibration  
    Normal Report after Recalibration  
If the sequence is done with bracketing:  
    Results of first cycle (ending previous bracket)

Signal 1: FID2 B,

| RetTime<br>[min] | Lvl<br>Sig | Amount<br>[ppm] | Area     | Amt/Area | Ref Grp | Name           |
|------------------|------------|-----------------|----------|----------|---------|----------------|
| 2.731            | 1          | 4.85000         | 1.67100  | 2.90245  |         | Ethylene oxide |
|                  | 2          | 24.26000        | 9.07357  | 2.67370  |         |                |
|                  | 3          | 80.87000        | 28.53073 | 2.83449  |         |                |
|                  | 4          | 242.60000       | 80.34795 | 3.01937  |         |                |

More compound-specific settings:

Compound: Ethylene oxide  
Time Window : From 2.685 min To 2.750 min

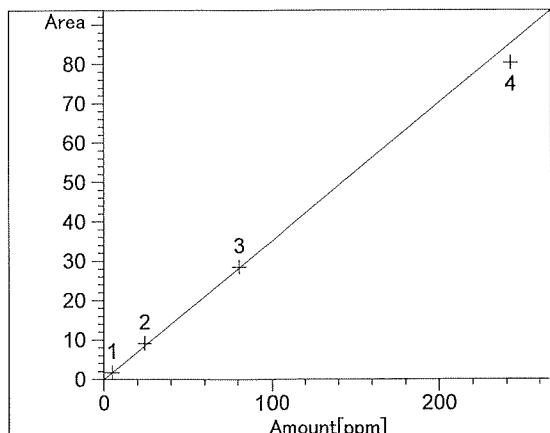
=====

Peak Sum Table

=====

\*\*\*No Entries in table\*\*\*

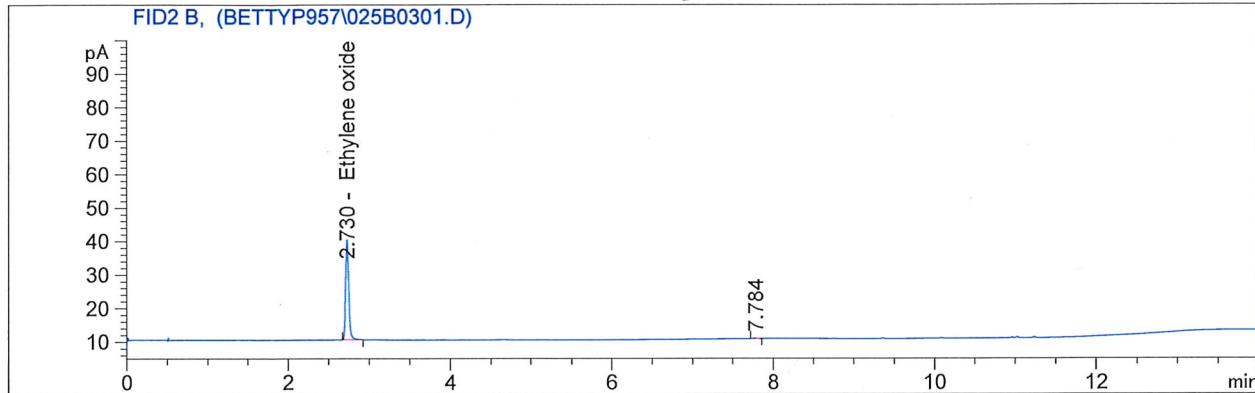
### Calibration Curves



Ethylen oxide at exp. RT: 2.731  
FID2 B,  
Correlation: 0.99840  
Residual Std. Dev.: 3.49505  
Formula:  $y = mx + b$   
m: 3.51485e-1  
b: -1.28762e-2  
x: Amount  
y: Area  
Calibration Level Weights:  
Level 1 : 1  
Level 2 : 0.039967  
Level 3 : 0.003597  
Level 4 : 0.0004

Sample Name: BettyP957 #EO4 ENV(1=0,6=499)

=====  
Acq. Operator : Justin Guenzler Seq. Line : 3  
Acq. Instrument : Betty Location : Vial 25  
Injection Date : 11/16/2018 11:26:24 AM Inj : 1  
Inj Volume : 250  $\mu$ l  
Acq. Method : C:\GC\2018\BETTY\QUARTER 4\BETTYP957\GC142P133\_CAL.M  
Last changed : 10/18/2017 9:57:08 AM by Justin Guenzler  
Analysis Method : C:\GC\2018\BETTY\METHODS\BETTYP957\_EO.M  
Last changed : 11/21/2018 12:33:46 PM by Nicholas Traversa  
ECM Server : http://s022vas01/Enthalpy  
ECM Operator : Nicole West  
ECM Path : GC\2018\Betty\Quarter 4\BETTYP957.SC.SSIzip  
ECM Version : 2 (modified after loading)

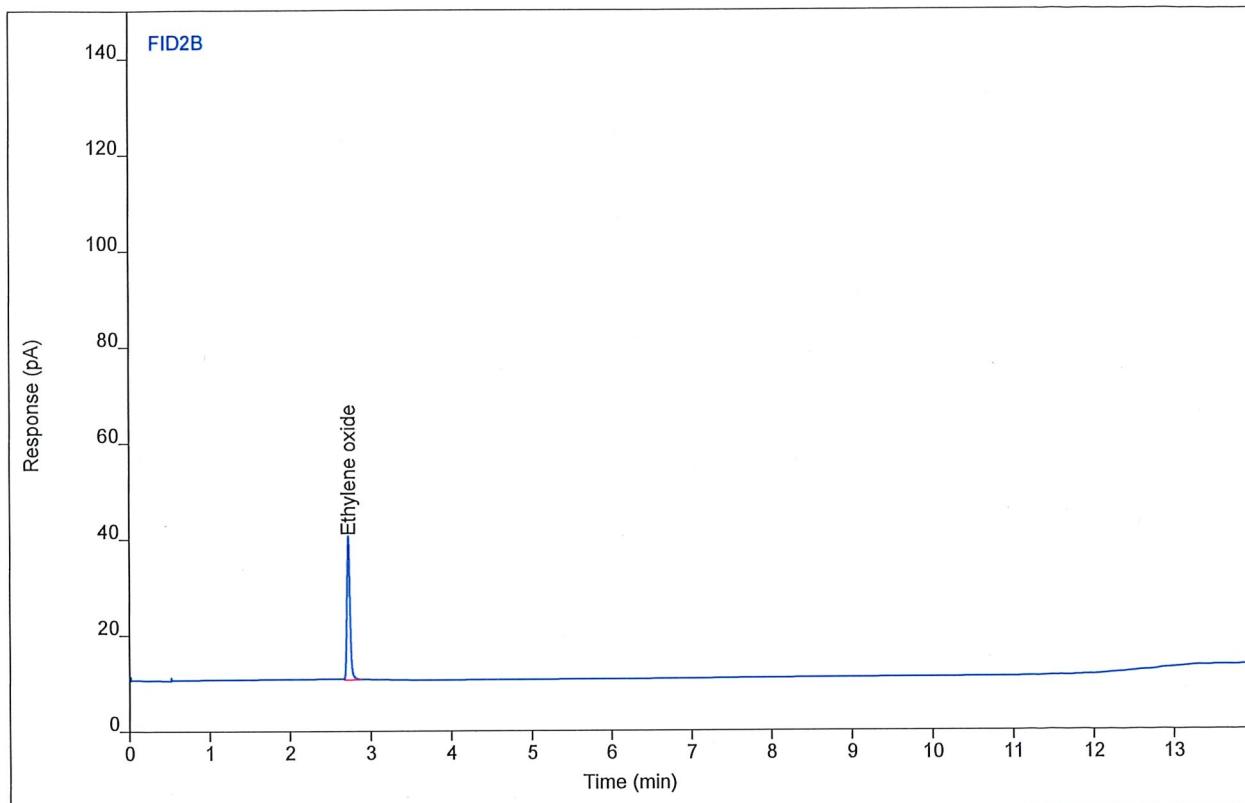


# Chromatogram Report

Sample Name BettyP957 #EO4 ENV(1=0,6=499)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0302.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 11:51 AM  
File Modified 11/20/2018 9:39 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



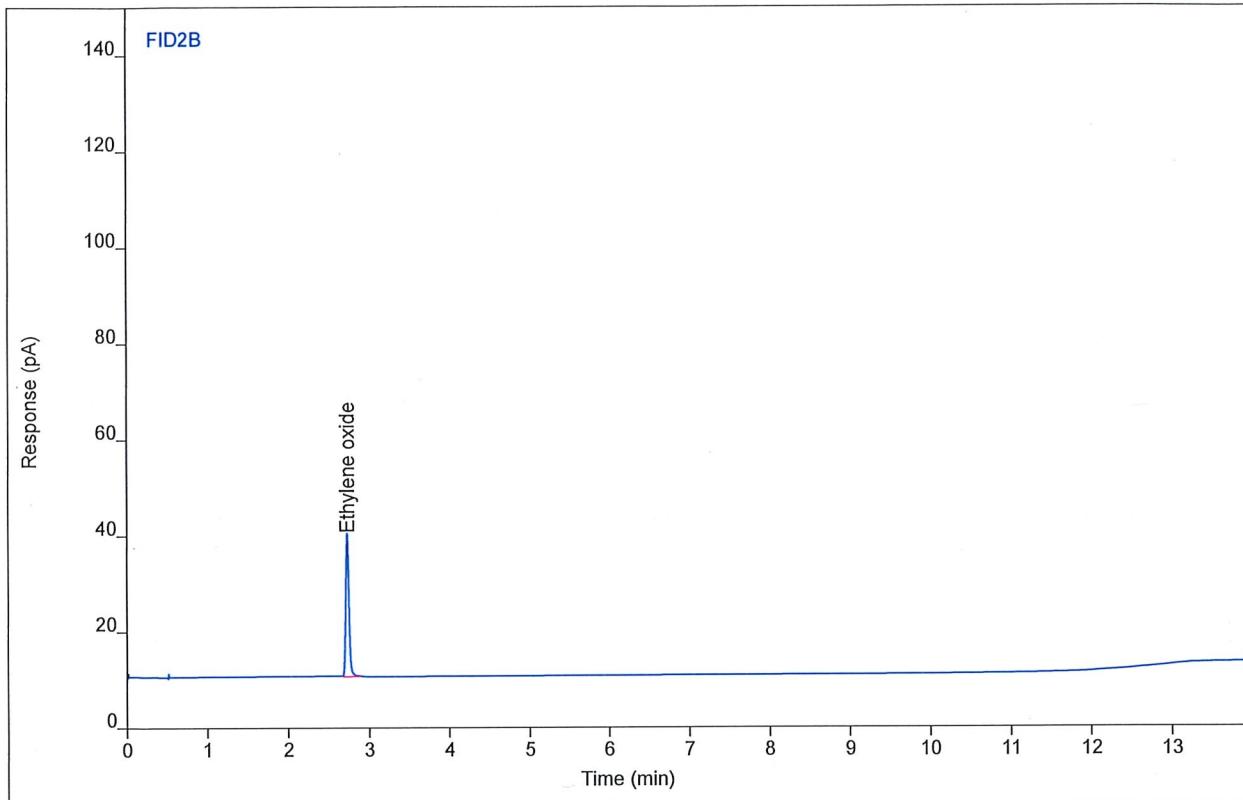
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 80.4440 | 29.9562 | 228.905 | 1  | 228.905 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO4 ENV(1=0,6=499)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0303.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 12:15 PM  
File Modified 11/20/2018 9:39 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 3 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



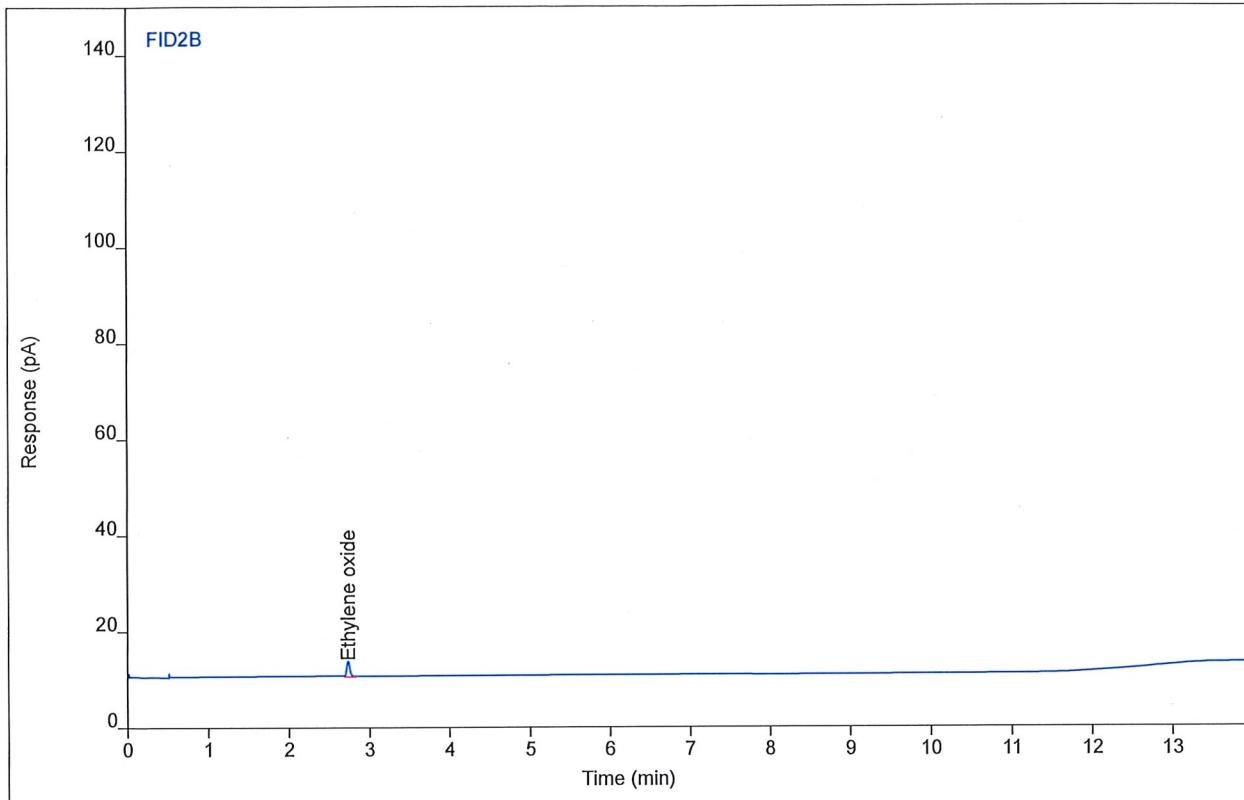
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 80.1692 | 29.8403 | 228.124 | 1  | 228.124 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO2 ENV(1=954,6=150)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0502.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 3:08 PM  
File Modified 11/20/2018 9:39 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Calibration  
Vial Number Vial 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



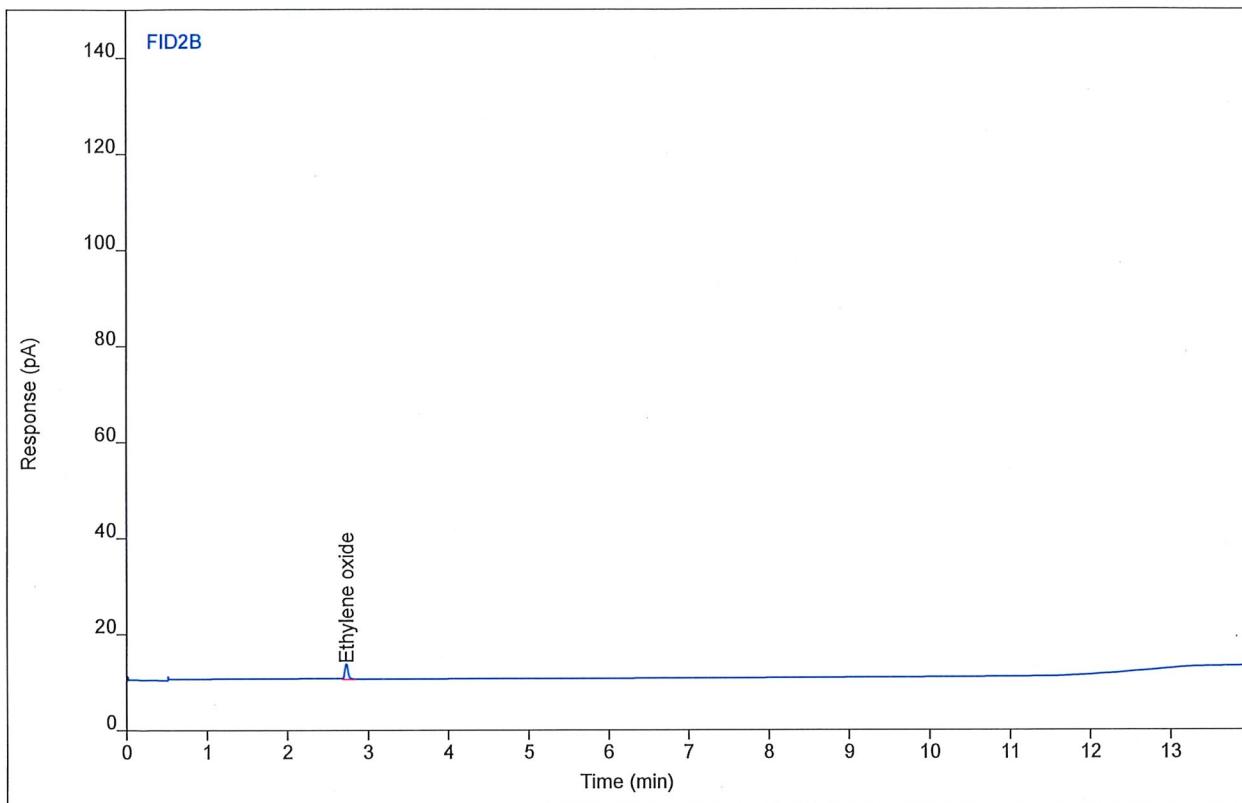
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.07502 | 3.29159 | 25.8557 | 1  | 25.8557 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO2 ENV(1=954,6=150)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0503.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 3:33 PM  
File Modified 11/20/2018 9:39 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



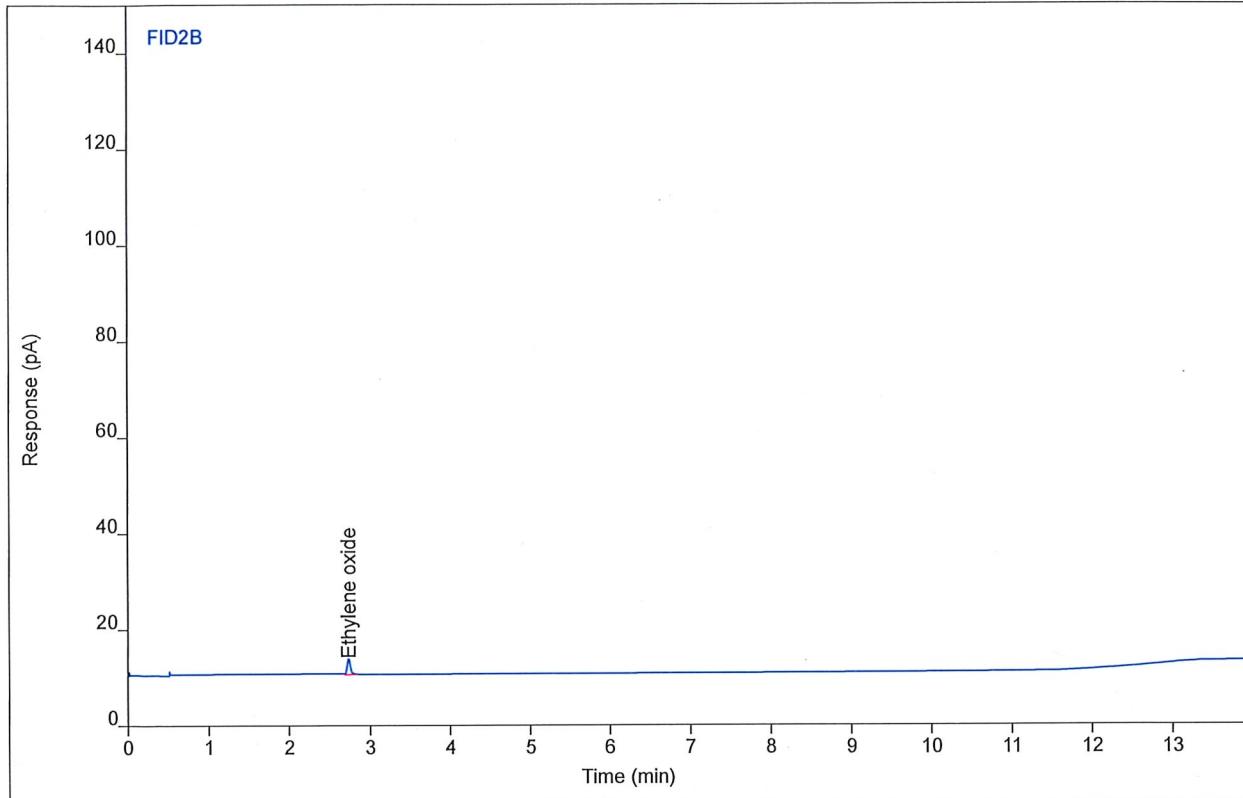
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.12168 | 3.31035 | 25.9884 | 1  | 25.9884 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO2 ENV(1=954,6=150)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0504.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 3:58 PM  
File Modified 11/20/2018 9:39 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 4 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



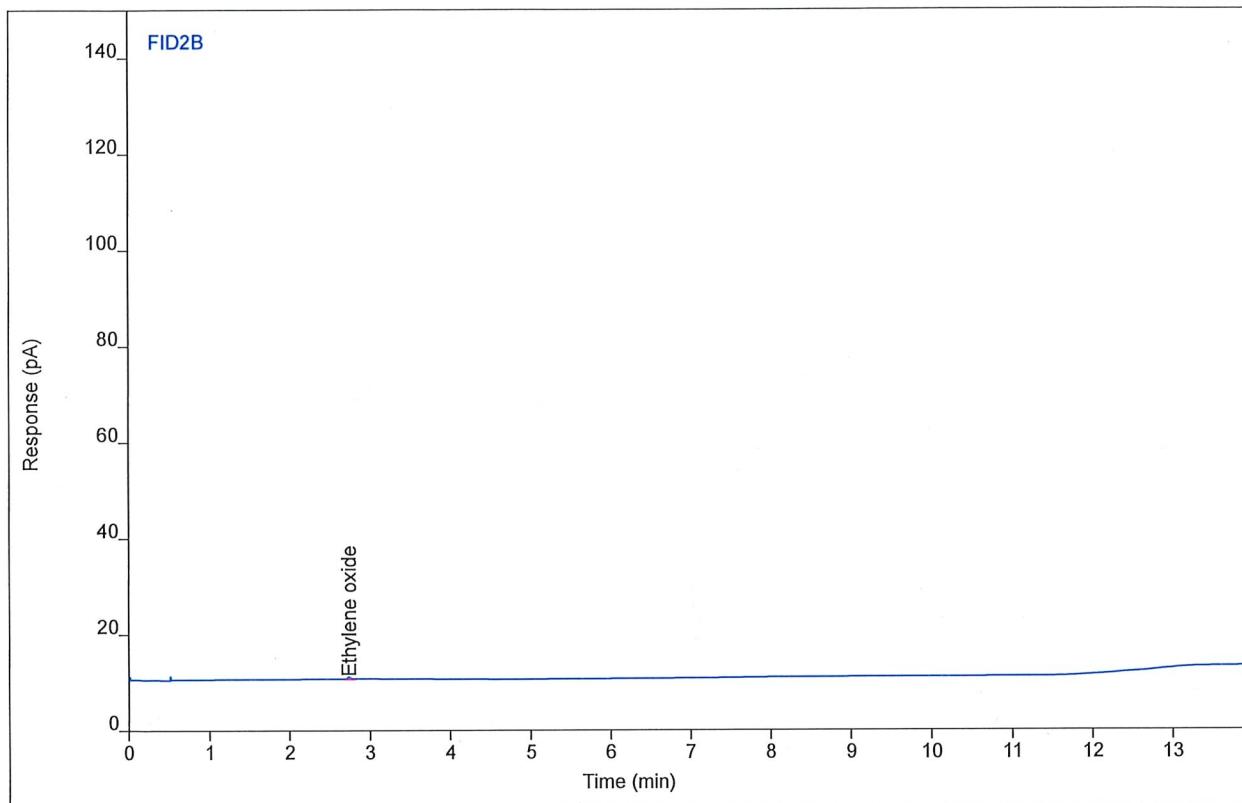
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.73 | 9.02403 | 3.29227 | 25.7106 | 1  | 25.7106 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO1 ENV(1=2770.12,6=80)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0606.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 6:26 PM  
File Modified 11/20/2018 9:40 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 6 of 8  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



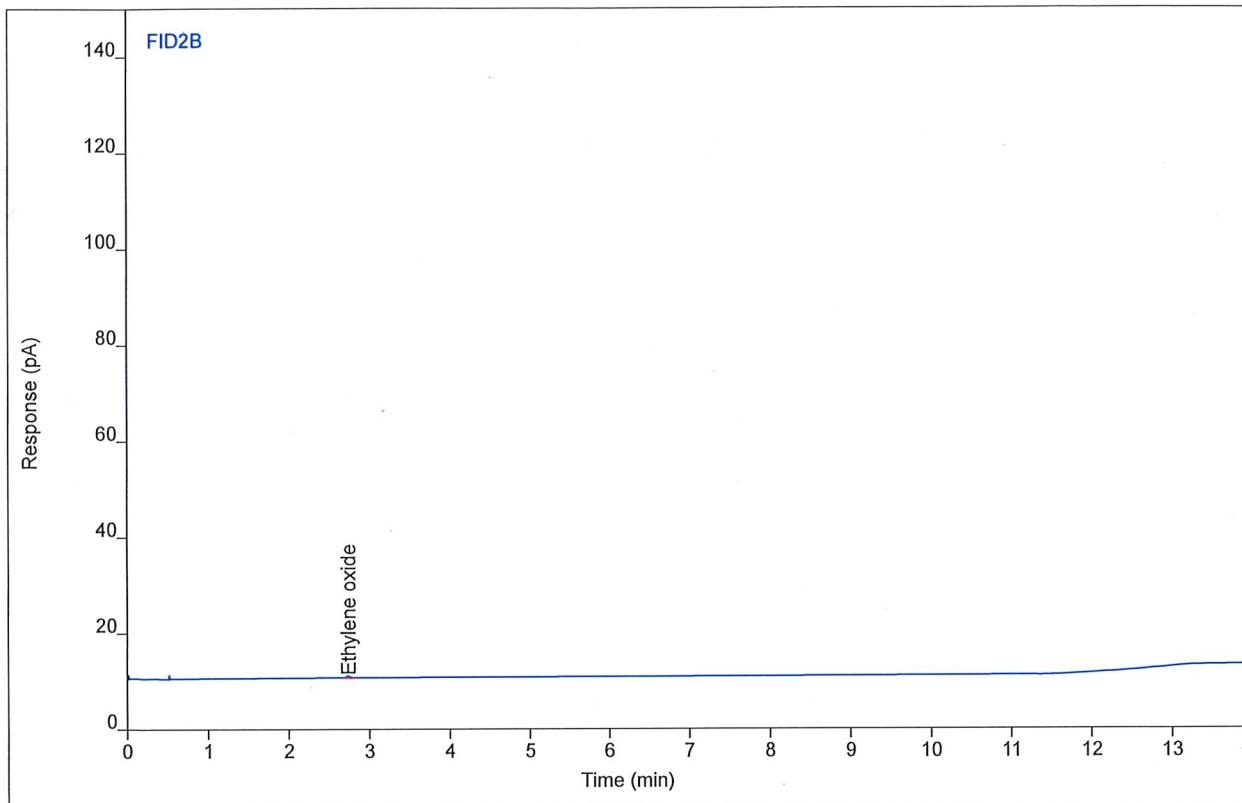
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.68674 | 0.59709 | 4.83541 | 1  | 4.83541 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO1 ENV(1=2770.12,6=80)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B0607.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/16/2018 6:50 PM  
File Modified 11/20/2018 9:40 AM  
Instrument Betty  
Operator Justin Guenzler

# Enthalpy Analytical

Sample Type Vial Number Calibration  
Vial 25  
Injection Volume 250  
Injection 7 of 8  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM

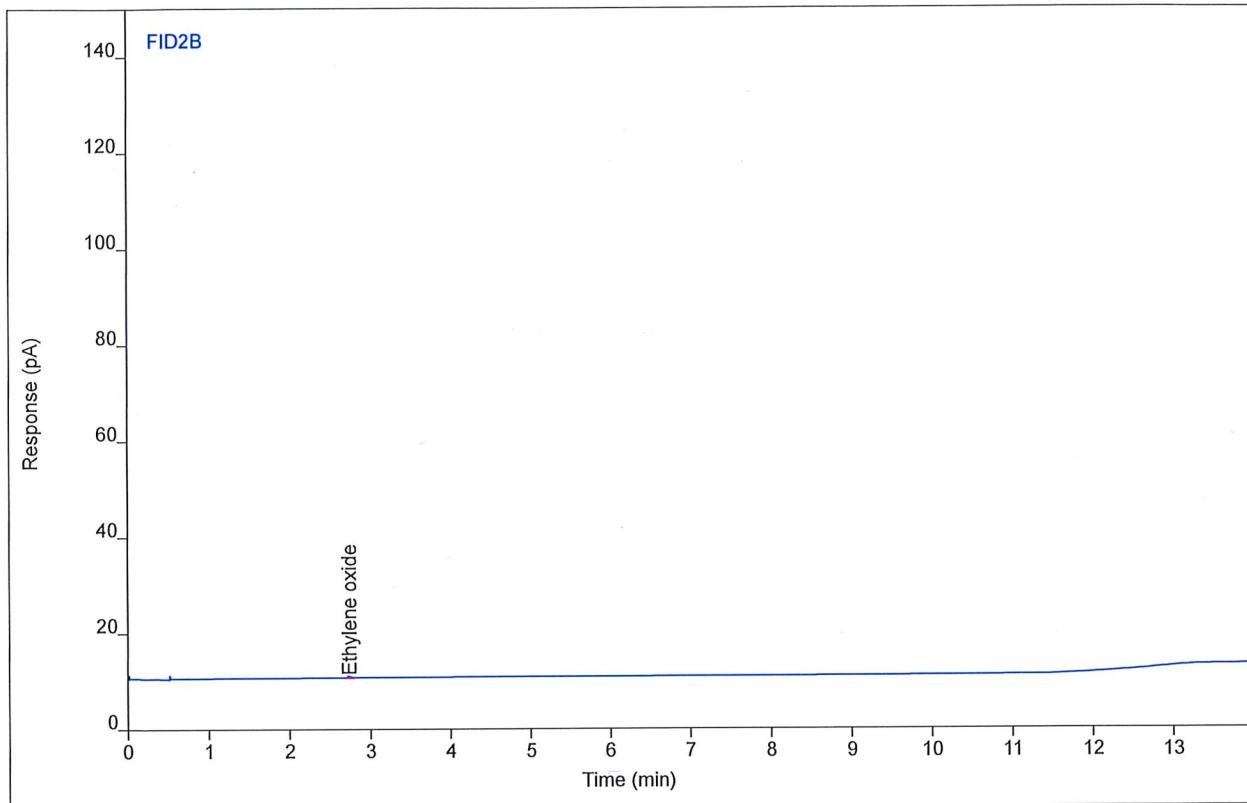


| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.66064 | 0.59885 | 4.76061 | 1  | 4.76061 | ppm  |

# Chromatogram Report

# Enthalpy Analytical

|                |                                    |                    |                     |
|----------------|------------------------------------|--------------------|---------------------|
| Sample Name    | BettyP957 #EO1 ENV(1=2770.12,6=80) | Sample Type        | Calibration         |
| Sequence Name  | BETTYP957 ver.2                    | Vial Number        | Vial 25             |
| Inj Data File  | 025B0608.D                         | Injection Volume   | 250                 |
| File Location  | GC/2018/Betty/Quarter 4            | Injection          | 8 of 8              |
| Injection Date | 11/16/2018 7:15 PM                 | Acquisition Method | GC142P133_CAL.M     |
| File Modified  | 11/20/2018 9:40 AM                 | Analysis Method    | BETTYP957_EO.M      |
| Instrument     | Betty                              | Method Modified    | 11/19/2018 9:56 AM  |
| Operator       | Justin Guenzler                    | Printed            | 11/21/2018 12:24 PM |



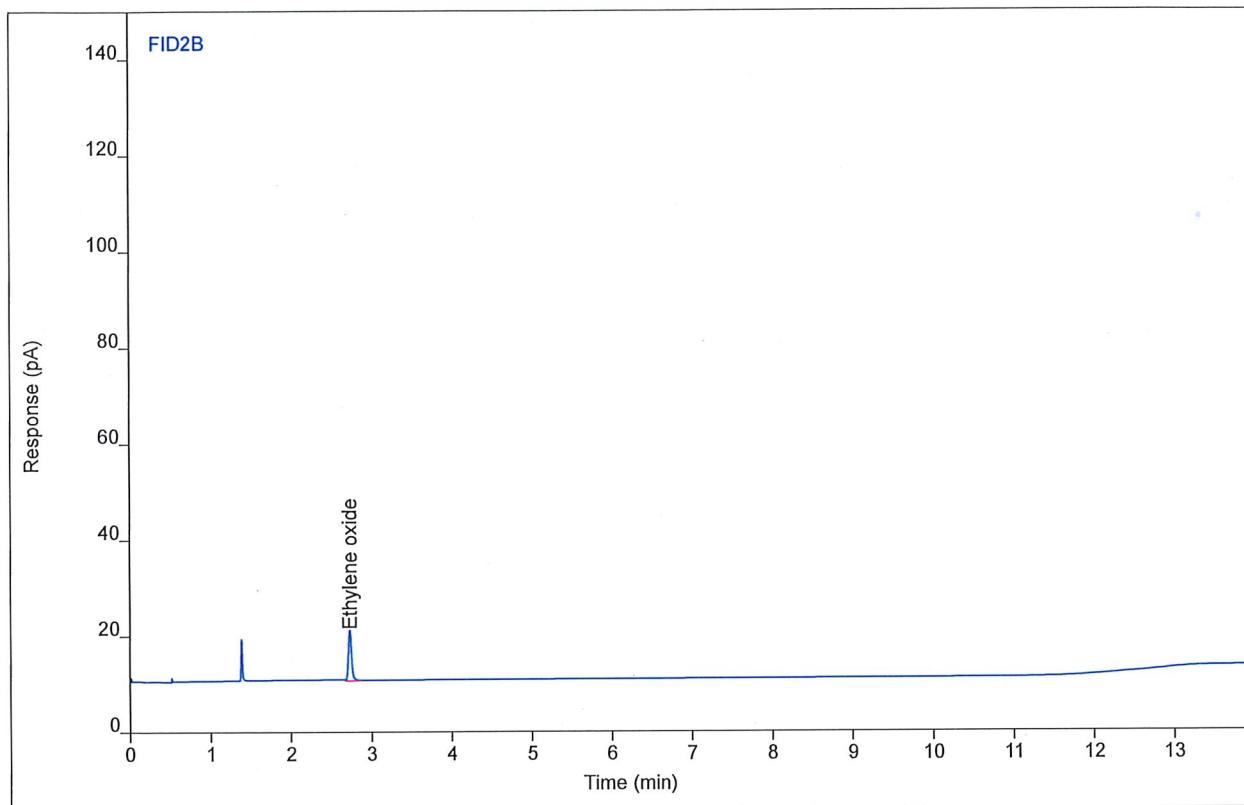
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | BB   | 2.74 | 1.66563 | 0.59604 | 4.77489 | 1  | 4.77489 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO3 ENV(1=565.33,6=400)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B1802.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/19/2018 8:45 AM  
File Modified 11/20/2018 9:41 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 2 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



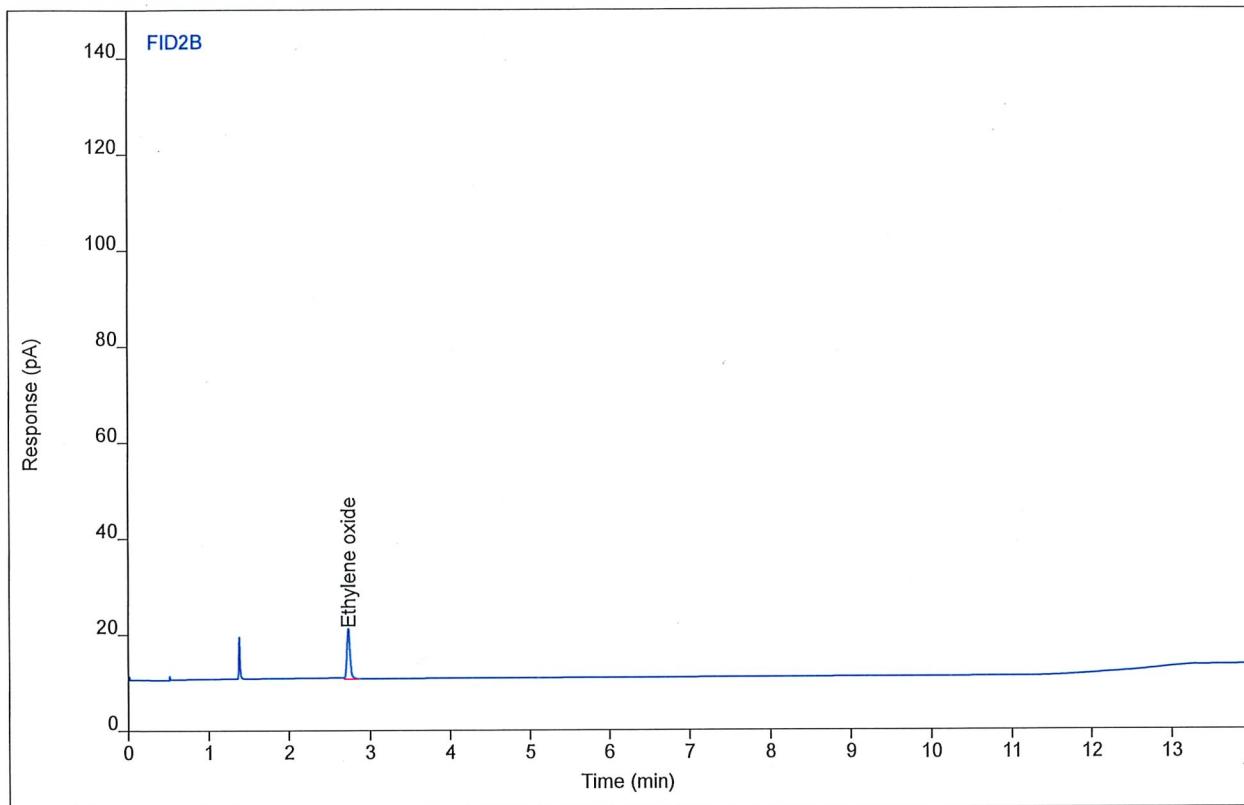
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 28.6763 | 10.6097 | 81.6228 | 1  | 81.6228 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO3 ENV(1=565.33,6=400)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B1803.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/19/2018 9:10 AM  
File Modified 11/20/2018 9:41 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial 25  
Vial Number 250  
Injection Volume 3 of 4  
Injection Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



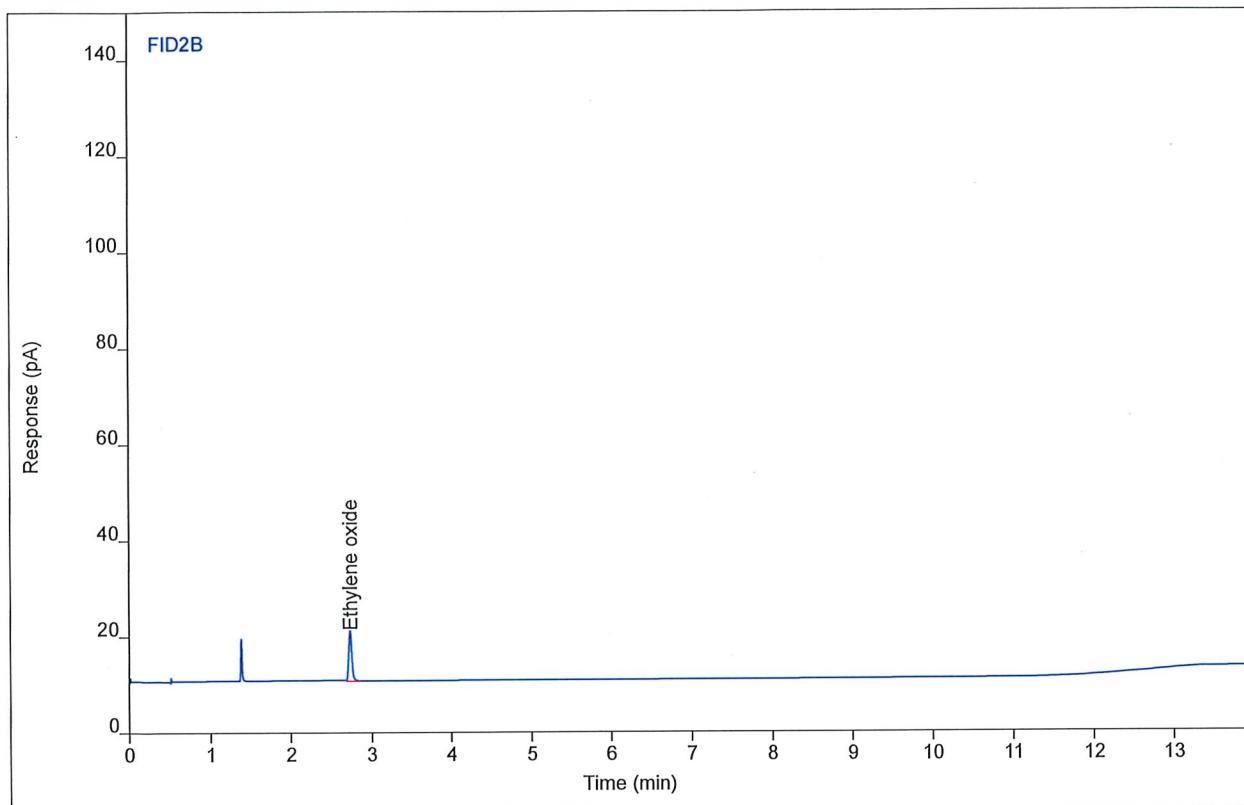
| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 28.5996 | 10.5987 | 81.4045 | 1  | 81.4045 | ppm  |

# Chromatogram Report

Sample Name BettyP957 #EO3 ENV(1=565.33,6=400)  
Sequence Name BETTYP957 ver.2  
Inj Data File 025B1804.D  
File Location GC/2018/Betty/Quarter 4  
Injection Date 11/19/2018 9:35 AM  
File Modified 11/20/2018 9:41 AM  
Instrument Betty  
Operator Nicholas Traversa

# Enthalpy Analytical

Sample Type Vial  
Vial Number 25  
Injection Volume 250  
Injection 4 of 4  
Acquisition Method GC142P133\_CAL.M  
Analysis Method BETTYP957\_EO.M  
Method Modified 11/19/2018 9:56 AM  
Printed 11/21/2018 12:24 PM



| Compound       | Type | RT   | Area    | Height  | Amount  | DF | SampAmt | Unit |
|----------------|------|------|---------|---------|---------|----|---------|------|
| Ethylene oxide | MM   | 2.73 | 28.3162 | 10.5413 | 80.5982 | 1  | 80.5982 | ppm  |

**CERTIFICATE OF ANALYSIS****Grade of Product: CERTIFIED HYDROCARBON**Customer: \*MORRISVILLE , NC\* - MONTROSE ENVIRONMENTAL  
GROUP

Part X02NI99C15ACKW8

Reference Number: 126-400875670-1

Number:

Cylinder CC122424

Cylinder Volume: 114.8 CF

Number:

Laboratory: 124 - LaPorte Mix (SAP) - TX

Cylinder Pressure: 1602 PSIG

Analysis Mar 09, 2017

Valve Outlet: 350

Date:

Lot Number: 126-400875670-1

Expiration Date: Mar 09, 2019

Traceability Statement: Hydrocarbon Process standards are NIST traceable either directly by weight or by comparison to Airgas laboratory standards that are directly NIST traceable by weight.

**CERTIFIED CONCENTRATIONS**

| Component      | Requested Concentration | Reported Volume % | Accuracy |
|----------------|-------------------------|-------------------|----------|
| ETHYLENE OXIDE | 250.0 PPM               | 242.6 PPM         | +/- 2%   |
| NITROGEN       | 99.98 %                 | 99.97574 %        | +/- 2%   |

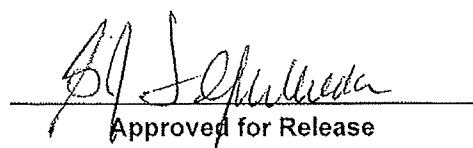
Permanent Notes: MONTROSE ENVIRONMENTAL/ENTHALPY ANALYTICAL

Notes:

RECERTIFICATION

PO # 1007021

MONTROSE ENVIRONMENTAL / ENTHALPY ANALYTICAL

  
Approved for Release

Page 1 of 126-400875670-1

## 6890 GC METHOD

## OVEN

Initial temp: 40 C (On)  
 Initial time: 6.00 min  
 Ramps:  
 # Rate Final temp Final time CRYO (N2)  
 1 30.00 220 2.00 Cryo: Off  
 2 0 (Off) Cryo fault: On  
 Post temp: 40 C Cryo timeout: 40.00 min (On)  
 Post time: 0.00 min Quick cryo cool: Off  
 Run time: 14.00 min Ambient temp: 30 C

## FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
 Initial temp: 200 C (On)  
 Pressure: 60.0 psi (On)  
 Purge flow: 0.0 mL/min  
 Purge time: 0.00 min  
 Total flow: 12.3 mL/min  
 Gas saver: Off  
 Gas type: Helium

## BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
 Initial temp: 200 C (On)  
 Pressure: 11.6 psi (On)  
 Split ratio: 5:1  
 Split flow: 12.3 mL/min  
 Total flow: 17.6 mL/min  
 Gas saver: Off  
 Gas type: Helium

## COLUMN 1

Packed Column  
 Model Number: 19808  
 Description: Rt-ShinCarbon 2m x 1mm I  
 Max temperature: 250 C  
 Mode: constant pressure  
 Pressure: 60.0 psi  
 Inlet: Front Inlet  
 Outlet: Front Detector  
 Outlet pressure: ambient

## COLUMN 2

Capillary Column  
 Model Number: 10198  
 Description: Rtx-1 30m x 0.32mm x 4um  
 Max temperature: 250 C  
 Nominal length: 30.0 m  
 Nominal diameter: 320.00 um  
 Nominal film thickness: 4.00 um  
 Mode: constant flow  
 Initial flow: 2.5 mL/min  
 Nominal init pressure: 11.6 psi  
 Average velocity: 39 cm/sec  
 Inlet: Back Inlet  
 Outlet: (other)  
 Outlet pressure: ambient

## FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
 Reference flow: 20.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 10.0 mL/min (On)  
 Makeup Gas Type: Helium  
 Filament: On  
 Negative polarity: On

## BACK DETECTOR (FID)

Temperature: 250 C (On)  
 Hydrogen flow: 60.0 mL/min (On)  
 Air flow: 450.0 mL/min (On)  
 Mode: Constant makeup flow  
 Makeup flow: 40.0 mL/min (On)  
 Makeup Gas Type: Nitrogen  
 Flame: On  
 Electrometer: On  
 Lit offset: 2.0

## SIGNAL 1

Data rate: 20 Hz  
 Type: front detector  
 Save Data: On

## SIGNAL 2

Data rate: 20 Hz  
 Type: back detector  
 Save Data: On

## THERMAL AUX 1

Use: Valve Box Heater  
 Initial temp: 130 C (On)

## VALVES

Valve 1 Gas Sampling  
 Loop Volume: 0.250 mL

## POST RUN

Post Time: 0.00 min

dified on: 5/5/2014 at 7:51:02 AM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time(min) | Parameter & Setpoint         |
|-----------|------------------------------|
| 3.00      | Front Detector Polarity: Off |

=====  
6890 GC METHOD  
=====

OVEN

Initial temp: 40 C (On) Maximum temp: 250 C  
Initial time: 3.00 min Equilibration time: 0.50 min  
Ramps:  
# Rate Final temp Final time CRYO (N2)  
1 0 (Off) Cryo: Off  
Post temp: 40 C Cryo fault: On  
Post time: 0.00 min Cryo timeout: 40.00 min (On)  
Run time: 3.00 min Quick cryo cool: Off  
Ambient temp: 30 C

FRONT INLET (SPLIT/SPLITLESS)

Mode: Splitless  
Initial temp: 200 C (On)  
Pressure: 60.0 psi (On)  
Purge flow: 0.0 mL/min  
Purge time: 0.00 min  
Total flow: 12.3 mL/min  
Gas saver: Off  
Gas type: Helium

BACK INLET (SPLIT/SPLITLESS)

Mode: Split  
Initial temp: 200 C (On)  
Pressure: 11.7 psi (On)  
Split ratio: 5:1  
Split flow: 12.3 mL/min  
Total flow: 17.6 mL/min  
Gas saver: Off  
Gas type: Helium

COLUMN 1

Packed Column  
Model Number: 19808  
Description: Rt-ShinCarbon 2m x 1mm I  
Max temperature: 250 C  
Mode: constant pressure  
Pressure: 60.0 psi  
Inlet: Front Inlet  
Outlet: Front Detector  
Outlet pressure: ambient

COLUMN 2

Capillary Column  
Model Number: 10198  
Description: Rtx-1 30m x 0.32mm x 4um  
Max temperature: 250 C  
Nominal length: 30.0 m  
Nominal diameter: 320.00 um  
Nominal film thickness: 4.00 um  
Mode: constant flow  
Initial flow: 2.5 mL/min  
Nominal init pressure: 11.7 psi  
Average velocity: 39 cm/sec  
Inlet: Back Inlet  
Outlet: (other)  
Outlet pressure: ambient

FRONT DETECTOR (TCD)

Temperature: 275 C (On)  
Reference flow: 20.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 10.0 mL/min (On)  
Makeup Gas Type: Helium  
Filament: On  
Negative polarity: On

BACK DETECTOR (FID)

Temperature: 250 C (On)  
Hydrogen flow: 60.0 mL/min (On)  
Air flow: 450.0 mL/min (On)  
Mode: Constant makeup flow  
Makeup flow: 40.0 mL/min (On)  
Makeup Gas Type: Nitrogen  
Flame: On  
Electrometer: On  
Lit offset: 2.0

SIGNAL 1

Data rate: 20 Hz  
Type: front detector  
Save Data: On

SIGNAL 2

Data rate: 20 Hz  
Type: back detector  
Save Data: On

THERMAL AUX 1

Use: Valve Box Heater  
Initial temp: 130 C (On)

POST RUN

Post Time: 0.00 min

VALVES

Valve 1 Gas Sampling  
Loop Volume: 0.250 mL

dified on: 2/17/2014 at 5:52:35 PM

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

Valve 2 Gas Sampling

Loop Volume: 0.250 mL

Load Time: 0.10 min

Inject Time: 0.50 min

Inlet: Front Inlet

TIME TABLE

| Time (min) | Parameter & Setpoint |
|------------|----------------------|
|------------|----------------------|

**This Is The Last Page  
Of This Report.**

